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Treatment of Deafness

ROSS T. McINTIRE*

WASHINGTON, D. C.

THE treatment of deafness has given the otologist great concern throughout many decades. The reason for this is the slow development of the methods of treatment. The causes of deafness have been reasonably well understood, but a sound approach in prophylaxis and preventive measures has never been too well established. Sporadic attempts have been made in research in this disability and again the results have been disappointing. It is my intention here to review the experience that we in the Navy have had in preliminary research in the cause, prevention, and treatment of deafness, and also to project some of the ideas that we have for our peacetime program.

We have recognized three types of deafness: (1) the chronic progressive type; (2) the nerve types; and (3) those types caused by disease, in other words, anything that causes chronic otitis media.

The broad classification of chronic progressive deafness includes those persons in whom the predominant findings are: (1) reasonably normal tympanic membranes; (2) a negative Rinne's test; and (3) a gradual increasing profundity of hearing impairment. The patient very often reports a familial history of deafness. Audiometric tests show a mixed loss of hearing tones.

The nerve type of deafness, as seen in the Navy, is very often traceable to damage from heavy gunfire. It is reasonable to expect that damage to the acoustic mechanism might cause immediate deafness. This is not true. There will be an immediate loss due to the inflammation of the end organ, but there usually is some improvement in a few days. We have observed, however, that there will be a slow loss of hearing that very often covers a period of one to two years, until a time when the deafness is severe enough to be incapacitating.

It is interesting to note the symptoms that have been given by patients suffering from nerve involvements. One of the most common complaints is the combination of tinnitus and headache; others complain of vertigo. Unfortunately, the patient very often delays going to the doctor and giving him the picture until his hearing deficiency is so marked that the case is very difficult to handle.

One of the situations that must always be considered is the possibility of malingering, but there again the positive side must not be overdone, since so often the man who has nerve deafness is likely to give an impression of malingering. Then, too, we have what is known as situational deafness. This may be due to exposure to gunfire, blast, or the noise of heavy machinery. This condition will be supported by functional and audiometric tests.

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NOTE: Read by Commodore G. C. Adams before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

The duration of this disability is apt to be relatively short. Very often we find men who have this real condition falling into the malingerer class because they are psychologically unstable. This situation requires a very understanding attitude on the part of the medical officer.

One of the greatest troubles we have experienced is getting the patient under treatment in a reasonably short space of time. Our average has been six to eighteen months. In other words, our nerve deafness cases have gone through the cycle of typical gunfire hearing loss before we see them. This is something that civilian specialists should consider in a comparable way in those patients who are injured in industrial occupations where they have been subjected to blast and noise.

It is unnecessary for me to spend much time on the third division of chronic otitis media. The causes are well known, and the specialist in otolaryngology today has been given every opportunity to understand what can be done in the way of treatment. Our program of aural rehabilitation is based on the experience of modern medicine and the best of rehabilitative measures. There enters into the purely medical problem the question of well-being. We must assume that diseases of the upper respiratory tract play a most important role in the causation of complicated infections of the eustachian tube, middle ear, and mastoid process. Then, too, we are well aware that nerve deafness may result from toxic substances such as may be produced by various foci of infection. Our practice in the treatment of suppurative ears is conservative. We believe that the irradiation of the nasopharynx should be considered as standard practice, as it has been well demonstrated by Crowe and others that the removal of lymphoid tissue from the nasopharynx can be done successfully. We have seen much improvement from that form of treatment.

THE true case of otosclerosis now has real hope in the fenestration operation that has been developed by Lempert so that over 65 per cent of the presumptive cases show complete recovery to normal hearing levels. Because of this fact, the Navy has been training a number of its specialists in the advanced technic of this operation. A series of cases in three major hospitals have undergone this operation, and since they can be well controlled, progress reports will be available.

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It is not enough, however, to talk about the pure treatment of deafness without including in it, as a real part, a well-rounded program that rehabilitates the hard-of-hearing. Consequently, rehabilitation of the deaf will be continued during peacetime, and the acoustic clinic, as set up at the Philadelphia Naval Hospital, will continue to carry on the work. This program is guided by a group of relatively simple rules: (1) the patient whom we serve is a man who has lost some or all of his hearing; (2) his loss is likely to be permanent; (3) the discovery of this loss and its implications represent for him a major crisis of adjustment; and (4) the man must learn to live as successfully and happily as possible despite this loss.

The first task of any rehabilitation unit is the selecting, training, and supervising of a staff of specialists so that the problem that covers

all points may be attacked intelligently. The psycho-physio-social results will best be attained if an appraisal is made according to the four rules listed. Moreover, we have found that a hearing deficit assumes meaning only when it is viewed in relation to the fact that the ability to hear is the one basic and essential requirement for personal adjustment. Whatever else it may be, *hearing in a human being is the most important single factor in his communicating system.* We might feel that vision would be the most necessary, but we have found that the psychological condition that exists in the man who cannot hear disturbs him much more in his surroundings with his fellow man than the inability to see. In fact, we know that lack of proper hearing disturbs speech, and when a man misses a key word in a sentence because of his hearing defect, very naturally his reply will be erroneous. After a number of false answers, his personality suffers.

One of the requirements set down in our acoustic clinic in developing the method to help the hard-of-hearing is to answer such questions as: "Who is the man who does not hear; what has he been, and what has he done in the past; what is he likely to be and to do in the future?"

To measure the actual deficit by the number of decibels of hearing loss, as shown by objective tests, is of course very necessary, but many patients who suffer only slight losses in hearing acuity may be more seriously handicapped than those who have a very great defect. Such differences can only be explained in terms of the individual personality.

It was considered imperative, therefore, that within the limits of personnel and equipment the rehabilitative processes must be individualized. A sincere effort was made to understand persons who suffered a hearing loss. It was essential also that the patient, as well as his teachers and clinicians, should come to regard his disability as a permanent and lasting one. It was made evident that he must be prepared to accept the fact that his chances of physiologic improvement were too small to run the risk of waiting for them to occur. He was given a proper evaluation of what medical or surgical treatment could do for him. In this way he was encouraged to accept the more practical course of developing effective structures of compensation that would be as permanent and as lasting as the disorder itself. In other words, the amount of residual hearing that the man possessed must be put to its maximum use.

A SUDDEN loss of hearing very often has a heavy impact upon the personality of the individual. Those who have lost hearing over many years are ofttimes unconscious of the steady downgrade, and adjustments have already been made. This type of case is also difficult, for once he realizes his danger, he becomes one of the most insecure of the group that must be rehabilitated. He comes to think of himself as peculiar and eccentric. He moves easily into the attitude of self-pity and antisociality.

The most positive and prompt deterrents to the growth of these handicapping attitudes are the development of practical skills in communication by the employment of other sensory channels, together with a more effective use of residual capacities. He must come to see that he must compete in a highly competitive world, but more than this, that he can be equipped to meet the competitions with new abilities and skills. The patient must be made aware that he is not a deafened man who must find ways to appear normal, but rather that he is a relatively normal man and must find ways to show that he is a successful deafened man.

Consequently, our experience has justified the use of the principle of treating the whole personality of which limitation of hearing is a significant, but not a disproportionately important part. The overall principle which unifies our various methods has given order and direction on the part of a variety of specialists who might have attacked the problems in different ways. Our experience has been most successful.

So that I may present the concrete method of the treatment of deafness as we have found it in the Navy, I will recapitulate.

All treatment is predicated on functional testing procedures for diagnosis and accurate evaluation of the results of treatment. In addition to the usual history and physical examination, classical fork tests, audiogram, and whispered and conversational voice tests, the speech reception test, both monaural and in a free field, has aided greatly in the accurate measurement of residual function. This apparatus was developed under the auspices of the National Research Council for the Army and Navy Aural Rehabilitation Services and consists essentially of an electronic device to transmit high-fidelity recorded or free speech at any intensity level. It is calibrated in decibels from 1 to 100. Noise masking may also be added in measured amounts. It is anticipated that use of this instrument before and after the fenestration operation or other methods of treatment will greatly facilitate evaluation of results.

A careful search for factors that may still be operative in causing or aggravating existing deafness is first made. Thus otitis media, if present, is adequately treated either by accepted medical or surgical means. Personnel who show evidence of high susceptibility to acoustic trauma are cautioned to avoid future exposure. The use of ear wardens by persons necessarily exposed to loud noises, either of the continuous type, such as those caused by airplane engines, or the explosive type, will do much to reduce the incidence of traumatic deafness. While adenoid hyperplasia is usually associated with children, many of our younger men have symptoms of persistent or recurrent eustachian salpingitis with peritubal lymphoid hyperplasia. These are treated by exposure to radium, using two 50 mg. nasal applicators. Aero-otitis media in flying and diving personnel is similarly treated. Any associated infections, such as sinusitis, are intensively treated when present.

Cases that are suitable for the fenestration operation, that is, those with non-catarrhal conductive deafness (otosclerosis) showing at least 40 decibels loss in the better ear for speech frequency, are offered the advantages of this operation. Since hearing aids are most effective in this type of deafness, many prefer wearing an aid to undergoing operation. Successfully operated cases can usually expect a gain of 25 to 30 db. Suitable cases should have no middle-ear disease or tympanic scarring, no appreciable loss of hearing for high frequencies, and a decibel loss no greater than 60 db in the speech frequencies. Even with good results from the operation, a hearing aid would still be necessary if the gain failed to raise the threshold to 30 db.

THE psychology of a patient is most important in diagnosis and treatment. Recently deafened individuals either often try to minimize or hide their defect by guessing and bluffing or withdrawing their attention. The former tend to be sensitive or irritable, while the latter become introspective and detached. Some patients develop psychogenic overlays, thus exaggerating an existing organic deafness; others may develop typical hysterical deafness. While the latter is rare, the former is not uncommonly engendered by worry, anxiety, and insecurity. Mild forms of overlay usually do not need treatment and disappear as the patient's hearing is improved by treatment, operation, or hearing aid. Marked cases are best treated by narcosynthesis or preferably hypnosis.

The recognition of a psychogenic component in deafness is important not only from the standpoint of prognosis and selection of treatment, but in the evaluation of therapy. It is not unusual to ascribe remarkable curative value to a treatment which acted largely by power of suggestion.

The positive power of suggestion is utilized in inducing psychological acceptance of a hearing handicap along with the urge to persist in a retraining program until this handicap is made minimal. This retraining program consists essentially of speech (lip) reading, auditory training, speech correction or prophylaxis, and vocational training. Speech reading stresses not only the observation of lip movements but also includes training in the interpretation of

all cues such as facial expression, gestures, etc. This training is particularly valuable in nerve deafness where consonants are poorly heard. Since the intelligibility of speech is largely dependent on consonants which are most easily read from the lips, speech reading restores communication to those who hear largely unintelligible vowels.

Cases of mild deafness may get practically normal reception by the use of a hearing aid alone. For these lip reading is an accomplishment which should be cultivated against a time when the hearing may become worse. In cases of marked deafness of the mixed or nerve type hearing aids do not, usually, give sufficient amplification of the higher frequencies for complete intelligibility, and lip reading must be used to supplement the aid. In complete deafness, speech reading is the main substitute, although not a complete one, for the hearing loss. A few individuals with very marked loss benefit from a hearing aid to obtain auditory cues to augment their lip-reading ability.

It has not been found feasible or necessary to fit aids to audiograms on the theory of selective amplification. In nerve deafness a slightly better performance can often be obtained by the use of an aid with a 6 db per octave "tilt," but such factors as amplification, quality of tone, body baffle, etc., require more careful consideration. Carefully fitted, individually molded, ear pieces are provided all patients at the outset of the retraining program. This eliminates feed-back "squeal," permits maximum amplification, and provides more accurate comparison of different aids.

At best, hearing aids can neither restore nor fully substitute for atrophied nerves. The patient with nerve deafness must go through an orderly and prolonged training process in order to get the maximum benefit of his aid as well as to learn the limitations he must accept. Many more patients with nerve deafness can now be successfully fitted with aids, in part because of the availability of instruments of greater precision and fidelity, but more particularly because of the formalized training process.

Auditory training is a relatively new concept. The failure of many individuals to adapt themselves to a hearing aid in the past was largely due to intolerance of ampified sound. The patient with conductive deafness presents no great problem because, as soon as sound penetrates beyond the conductive barrier, it is appreciated as a threshold sound. In nerve deafness, on the other hand, the phenomenon of recruitment causes acute distress, because as soon as the sound becomes audible it is appreciated as a loud sound. The greater the hearing loss, the louder the sound seems as soon as it becomes audible. The contrast is especially great when it is remembered that the patient has become used to a pathologically quiet world.

In order for nerve deafness cases to hear satisfactorily, it is necessary for them to become accustomed to amplified sound. It has been shown that the threshold of tolerance can be built up by gradually increasing exposure, and poor listening habits can be improved.

The modern hearing aid is a precision instrument and requires proper care and adjustment. Part of the patient's auditory training consists in learning how best to wear and care for the aid as well as its limitations. It has also been found useful to instruct patients in elementary anatomy, physiology, and pathology of hearing, with particular emphasis on the type of disability the patient has. With this knowledge, he feels more confident of himself, and the element of mystery is removed.

Speech correction is seldom a problem in the recently deafened. If a hearing aid can be worn so the patient hears his own voice, no appreciable speech deterioration usually takes place. Cases showing such changes require speech kinesthetic training under supervision of speech pathologists.

The Veterans' Administration supervises vocational training for ex-Army and Navy personnel. This is a most important phase of aural rehabilitation. When the patient competes suc-

cessfully for a job with unhandicapped persons and performs his job well and without strain, he has really overcome his handicap.

There is no reason why the principles that have been employed in our acoustic clinic at Philadelphia can not be applied in clinics in civil life. Modern acoustic clinics, with all the physical properties that have been provided for thorough diagnosis and training, should be set up at strategic places throughout the nation. The Veterans Administration, very naturally, has the responsibility of the veteran, but there will be tens of thousands of civilians who have been injured in industry where various forms of deafness will result. Now that there is an operative procedure for otosclerosis which promises great relief, facilities should be made available to the average citizen whereby diagnoses can be established and proper recommendations made as to the treatment that will be required.

One of the paramount factors that must always be thought of throughout the entire period of the deafened man's life is the care of his residual hearing. This fact, again, requires a central diagnostic clinic where the man can be checked from time to time.

It is my hope that in the field of social rehabilitation the experience gained in the handling of the many thousands of individuals who have suffered hearing defects during this past war will be put to use for the man, woman, and child in civil life who fall into this unfortunate class.

RH FACTOR AND ERYTHROBLASTOSIS

During the past few years the relationship of the Rh factor to erythroblastosis fetalis has been one of the most absorbing topics in obstetrics and pediatrics. Proper treatment of the erythroblastotic infant has been a serious problem. Transfusion with Rh negative blood has been used, as well as with Rh positive blood. Results have not been especially encouraging. The work of Snelling, reported in the *Canadian Medical Association Journal* for January, 1947, therefore, warrants the attention of every physician who has occasion to treat infants who suffer from Rh incompatibilities.

Over the past 10 years, Snelling has treated 143 cases of erythroblastosis. Prior to 1944 the infants were transfused with the blood of the same Landsteiner group. The mortality was 36.8 per cent for 1944 and 60.0 for 1945. During the first 5 months of 1946 a new technique was used. The mortality among 16 patients dropped to 6.2 per cent. Obviously, if Snelling's technique can be confirmed, it will be a most important advance in the treatment of erythroblastosis fetalis.

Snelling formerly transfused as often as necessary to keep the hemoglobin above 70 per cent. In an effort to conserve veins, he gave two transfusions at one time with a 6 to 12 hour interval between. The intravenous set was kept running with saline or glucose in saline, between transfusions. With this routine, however, some infants became edematous. When the serum protein was measured, it was found to be below the edema level. The routine, then, was changed. Plasma is now given as soon as the child is admitted. This is followed by transfusion. The intravenous is kept running with plasma by the continuous drip method. This change in method has been attended by a drop in mortality rate.

Surgery of Congenital Lesions of the Neck

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SURGICAL management of a congenital lesion of the neck consists primarily of a reversal of the embryonic process that has caused the congenital malformation. Although this sounds simple, it is not, since there still is considerable confusion and difference of opinion as to what these embryonic processes of the neck actually are. One should, however, have at least a diagrammatic knowledge of the embryology in order to cope with the situations as they arise.

EMBRYOLOGY

Noteworthy studies of the embryology of the neck have been made by His, Rathke, and others. Many investigators are of the opinion that the greatest contribution is that of Wenglowski, who published a monograph giving the findings of a detailed study of serial sections of human embryos size 2 mm. to 49 mm. I shall briefly summarize his findings and then deal with the clinical aspects.

During the second week of fetal life, changes begin in the foregut. From the interior or entodermal side, five outpouchings appear. These are called pharyngeal pouches. Simultaneously from the exterior or ectodermal side similar indentations occur. These are the branchial grooves.

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NOTE: Read before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

As these pouches and grooves approach each other, the mesoderm in between is pushed aside, so that for a time ectoderm and entoderm come into contact. The contacting areas are the closing membranes, which in gill-bearing animals disappear, forming the gill clefts. This, of course, does not occur in birds and mammals.

The mesoderm, which has thus been pushed aside, forms rounded bars of mesoderm. These are the branchial or visceral arches, of which there are six, all meeting ventrally in the midline of the neck. In each arch there is a cartilaginous bar and also the anlage of one of the primitive aortic arches. In the third of these the internal carotid anlage crosses over. (This position of the internal carotid has been the bone of contention in the controversy as regards origin of branchial fistula, as will be shown later).

The first, or mandibular, arch is the origin of the lower lip, mandible, muscles of mastication, and the anterior part of the tongue. Its cartilaginous bar forms the incus, malleus, and a portion of the mandible.

The second, or hyoid, arch is the origin of the structures of the upper neck. From it arise the styloid process, stylohyoid ligament, and lesser cornu of the hyoid bone.

The ventral ends of the second arch, along with those of the third, assist in the formation of the body of the hyoid bone and the anterior part of the tongue.

The third arch assists in the formation of the side of the neck and the greater cornu of the hyoid.

The ventral portions of the fourth and fifth assist in forming the thyroid cartilage, while the sixth is the origin of the cricoid, arytenoid, and tracheal cartilages.

The first two arches rapidly overlap the third, forming thereby a deep sulcus, the cervical sinus, which is considered by many to be the prime cause of branchial fistula.

From the first external indentation (the first branchial groove) arise portions of the auricle and external acoustic meatus. Of the remaining grooves no traces persist.

From the first internal indentation (first branchial pouch) are formed the eustachian tube and tympanic cavity, the tympanic membrane being formed by the closing membrane between the first groove and the first pouch. In the second pouch lies the anlage for the tonsil. Wenglowski demonstrated that from the third pouch on either side, a small duct, the thymic duct, descends into the mediastinum to form the thymus. This duct passes in the general direction of the sternomastoid muscle, laterally to the thyroid, and into the mediastinum. He likewise demonstrated remnants of this tubule in adult necropy dissections. Wenglowski contends that the fourth pouch is the origin of the lateral lobes of the thyroid, with the parathyroids likewise originating from this pouch.

It was Wenglowski's further contention that the entire branchial arch apparatus ends about the level of the hyoid and that lesions ending below this level could have nothing to do with the branchial arches themselves.

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DURING the third week a rounded swelling or bud appears on the ventral side just behind the first arch. This is the tuberculum impar, which, along with two similar lateral swellings, form the anlage of the buccal part of the tongue. A V-shaped swelling arising somewhat posteriorly is called the copula and is the anlage of the posterior part of the tongue.

In the fourth week a diverticulum descends between the tuberculum impar and copula and passes as a tubular duct toward the hyoid and downward in front of the trachea to form the middle lobe of the thyroid gland. The point of descent remains as a depression at the base of the adult tongue, which is known as the foramen caecum. This tubular structure is the thyroglossal duct, which is usually obliterated.

THYROGLOSSAL DUCT CYSTS AND FISTULAS

There is no controversy as to the origin of thyroglossal duct cysts and fistulas. Their development is definitely established as being the result of a failure of the embryonic thyroglossal duct to be obliterated wholly or in part.

Clinical picture—This condition is the commonest of the congenital anomalies. In a previous survey we found the cases occurring equally between males and females. In the past five years at the Los Angeles General Hospital we have had ten males and ten females with this condition. However, Pemberton's series of 293 cases had two males to one female.

Adequacy of drainage determines whether a cyst or a fistula is formed. Fifteen of our twenty cases began as cysts, and similarly Gross and Connerly reported a cyst beginning in 85 per cent of their cases.

The cyst may appear at any level from the foramen caecum to the suprasternal notch, and the fistula may likewise make its exit anywhere from the chin at the floor of the mouth to the suprasternal notch. They, however, rarely occur above the hyoid. The majority occur below the hyoid and considerably higher than the suprasternal notch, but they do occur at or near the midline in most instances.

The clinical picture of the cyst is that of a single, painless, soft, semifixed mass varying in size from a pea to a lemon. It occurs at or near the midline of the neck, and moves up on swallowing. Troublesome symptoms, such as choking or difficulty in swallowing or breathing, are rare and are limited to cysts occurring between the hyoid and foramen caecum. Secondary infection is, however, common, especially following an upper respiratory infection. With infection the process usually remains localized or becomes a localized abscess in the cyst. Occasionally, however, a severe cellulitis of the neck does develop. One of our twenty patients died from a fulminating cellulitis of the neck secondary to an infection of a thyroglossal cyst. This condition had been preceded by a streptococcic sore throat.

Differential diagnosis must be made from ranula, adenitis, pyramidal lobe of the thyroid, and branchial cleft anomalies.

Ranula occurs in the anterior part of the floor of the mouth and can be seen as a bluish cyst under the floor of the mouth at the anterior part of the tongue.

Adenitis either simple or tuberculous is rare in this area and is associated with other glands which are tender. Movement on swallowing does not take place.

A pyramidal lobe is attached to the thyroid near its isthmus and is practically never enlarged unless associated with a goiter.

With the fistulous opening there is a continuous or intermittent discharge of a clear, ropy, mucoid material, which, when infected becomes mixed with purulent discharge. A cord-like structure can frequently be felt, leading from the fistulous opening to the hyoid, which also moves on swallowing. Troublesome symptoms, as in the cyst, are usually those of infection associated with respiratory infections.

Pathology—The lining of the tract is epithelium, usually squamous or columnar with occasional ciliated cells surrounded by a lymphoid stroma.

Treatment—A reversal of the embryonic process is the only cure. This means dissection from the external opening to the hyoid and ending at the foramen caecum.

W. E. Sistrunk described a highly satisfactory method of removal, which today is almost universally accepted.

A HORIZONTAL incision about one and one-half inches long is made through skin and platysma and surrounds the cyst or sinus opening. The flaps are reflected and dissection is carried to the hyoid bone. Here the sinus may pass over, under, or through the hyoid and then proceeds to the foramen caecum. Beyond the hyoid the tract is usually of minute proportions and is easily overlooked. Methyl blue injections occasionally will stain the tract between the hyoid and foramen caecum, but in most instances staining will stop at the hyoid. Therefore, the midportion of the hyoid, about 1.5 cm. is removed with knife or scissors in children and with bone-cutting forceps in adults, and dissection of a core of tongue tissue is carried out to the foramen caecum.

To orient himself and aid the dissection the surgeon places a second sterile glove and sleeve over the left hand. The index finger is placed in the mouth of the patient at the foramen caecum and is pushed toward the hyoid bone. With the patient in the goiter position, at about a 45-degree angle, the fistulous tract, along with a portion of the mylohyoid, geniohyoid, and genioglossus muscles is dissected up to and including the foramen caecum. The muscles are loosely approximated and a split-tube drain

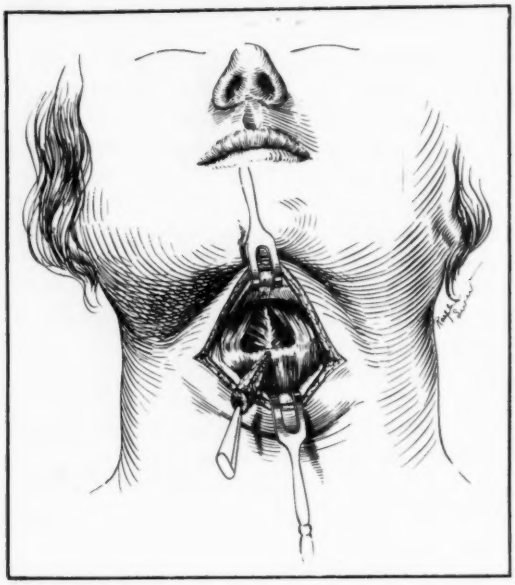


Figure 1. Excision of thyroglossal duct fistula. The platysma muscle has been reflected and dissection carried to the hyoid bone. (Upper left)

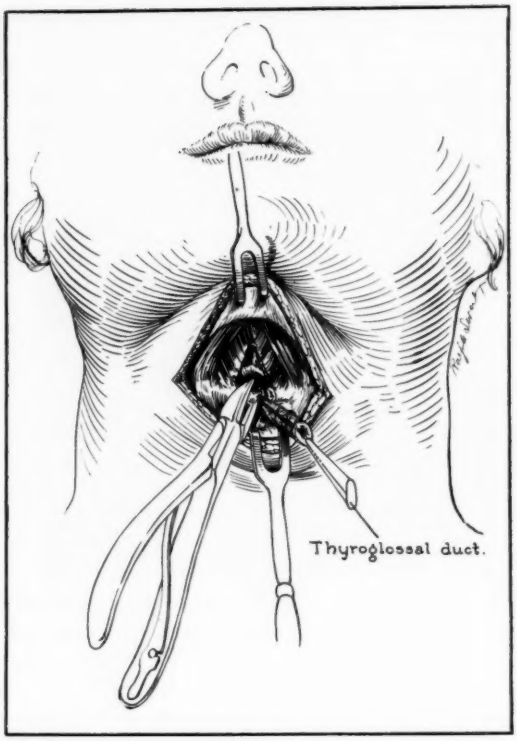


Figure 2. Excision of thyroglossal duct fistula. The midportion of the hyoid bone is being removed with bone forceps according to the method of Sistrunk. (Upper right)

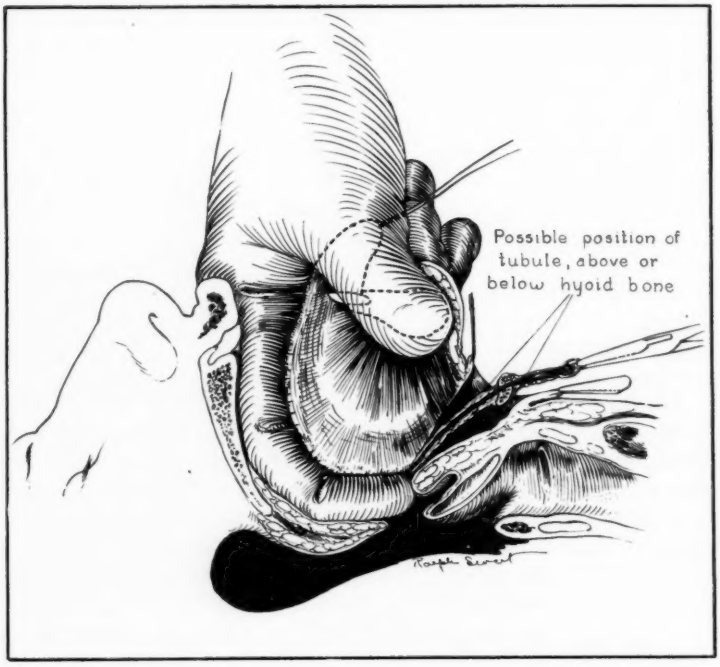
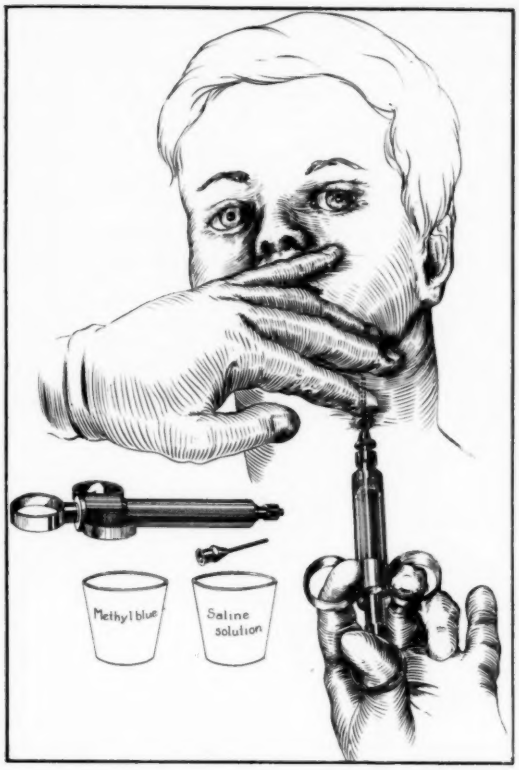


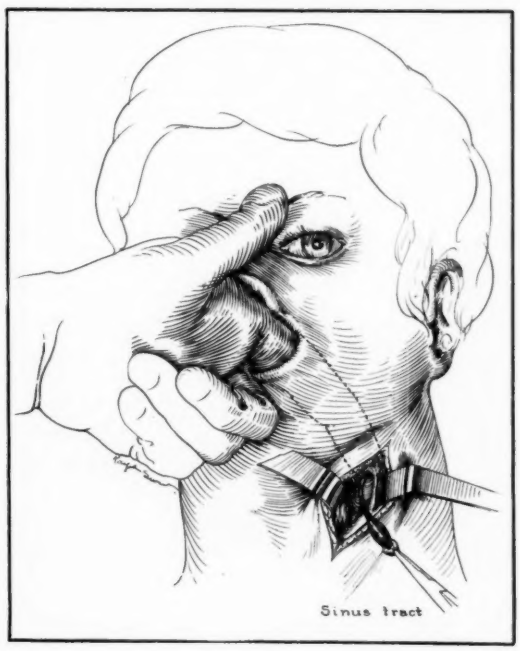
Figure 3. Excision of thyroglossal duct fistula. The midportion of the hyoid bone has been removed. From this point the tract is cored out in the direction of the Foramen Caecum, which is at about a 45-degree angle, with the patient in the goiter position. Dissection is carried up to a point where the finger at the Foramen Caecum can be identified: (Sistrunk).

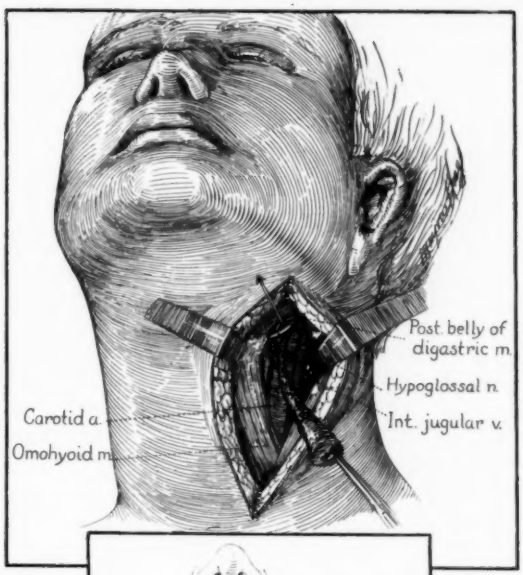
Credits for illustrations: Ralph Sweet, Artist.

Figures 1, 2, 3, 4 and 7, courtesy Surgery, Gynecology and Obstetrics.

Figures 5 and 6, courtesy Journal of the American Medical Association.







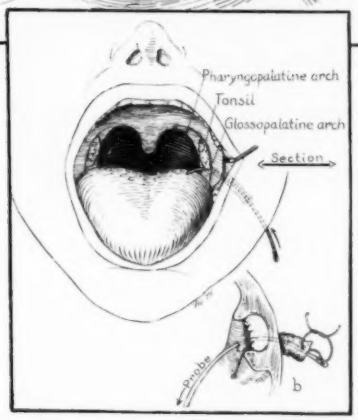


Figure 4. Excision of branchial fistula, showing armamentarium and method of massaging methyl blue into the tract. (Upper left)

Figure 5. Branchial Fistula. The tract lies along and beneath the sternomastoid muscle, extends up to the mid-portion of the posterior belly of the digastric where it arches medially to enter the tonsillar fossa. (Upper right)

Figure 6. Branchial fistula. Tract has been dissected up to arched passage into pharynx. (b) Shows method of inversion of stump. (Center right)

Figure 7. Excision of branchial fistula showing assistant's finger pushing outward in the region of the tonsillar fossa as dissection is carried to the pharynx. This is a satisfactory method when inversion is not feasible. The stump is tied and amputated when dissection has been carried to the finger pushing outward from the pharynx. (Lower left)

inserted. We have recently made no serious attempt to reunite the ends of the hyoid bone. The skin is closed in the usual manner.

The author has felt that surgery in infants should be postponed until the child is at least two years old. We have seen rather rapid enlargement of a cyst in infants and have been able to control the size by aspiration through a small wheal of novocaine using a large-gauge needle with strictest aseptic precautions.

In the presence of infection, hot compresses are applied together with penicillin or the sulfonamides or both. A localized abscess in a cyst is aspirated with a large needle as often as necessary. Usually three to four such aspirations are all that are needed. Incision, drainage, and packing of these cysts transform them into persistent, annoying, draining fistula.

BRANCHIAL CYSTS AND FISTULAS

There are several theories regarding the evolution of branchial cysts and fistulas. Among the most prominent are (1) that they are caused by a vestigial remains of the branchial grooves or arches; (2) that they are a persistence of the cervical sinus; (3) that they are due to a remains of the thymic duct, which descends from the third branchial pouch, as demonstrated by Wenglowski.

Clinical features—A distinction is frequently made between cysts and fistulas and each is classified as a separate entity. It appears that here, as in thyroglossal duct conditions, the question is wholly a matter of drainage. The sides of the neck are about equally involved. Occasionally they are bilateral. Distribution between the sexes is likewise equal.

In the past five years, of 18 cysts and fistulas occurring at the Los Angeles General Hospital, 10 opened on the left and 7 on the right, with 1 bilateral, while 9 were females and 9 were males.

Lahey found 56 per cent on the right and 40 per cent on the left. In a series of 69 cases Gross and Ladd reported 14 cysts to 55 fistulas. Of these cysts they found 7 on the right, 5 on the left, and 2 bilateral. Of the fistulas they found 24 on the right, 38 on the left, and 3 bilateral.

Clinically, a branchial cyst usually manifests itself as a semifixed, uniform, painless, nontranslucent unilocular swelling in the lateral side of the neck. It is not attached to the skin and usually occurs in the middle third of the neck. It may, however, occur at any level from the angle of the jaw to the sternum, but it has a rather definite relation to the anterior fibers of the sternomastoid muscle.

The size of the cyst varies; it may be as small as a centimeter in diameter or it may almost fill the entire side of the neck. Ordinarily, the cyst does not cause any particular discomfort. There have, however, been reports of serious trouble caused by pressure on neighboring structures, particularly difficulty in breathing or swallowing and reflex cough from pressure on the vagus. Infection does occur, especially in those cases having a connection with the pharynx.

The fistula likewise may occur at any level but again has a definite relation to the anterior border of the sternomastoid. The opening is frequently surrounded by a pigmented area, with an occasional piece of cartilage in the subcutaneous tissue. The discharge varies from a milky to a sticky, mucoid material.

The fistulous tract almost universally follows a course upward just behind the anterior fibers of the sternomastoid to a point at the midportion of the digastric muscle, where it arches medially under the stylopharyngeus muscle to empty in the side of the pharynx just below the tonsillar fossa. This tract can often be felt as a pencil-size cord running along deep to the anterior fibers of the sternomastoid muscle. Occasionally it can be demonstrated in its entirety by injection of radio-opaque substance. In fact, the author has had one boy who derived considerable amusement from watching the water squirt into his throat when the fistula at the base of the neck was irrigated.

There is an intermittent or continuous discharge of secretion; and recurrent attacks of inflammation are commonplace. Malignancy has been reported by a number of authors.

There was one malignancy of the neck in our hospital records, which was probably due to a malignant degeneration of a branchial fistula.

Differential diagnosis must be made from (1) thyroglossal cyst and fistula; (2) dermoid; (3) inflammatory and tuberculous adenitis; (4) hygroma; and (5) lipoma.

The thyroglossal duct and cyst occurs in the midline and invariably moves on swallowing. A dermoid may not be differentiated until its contents of hair and fluid are examined. Inflammatory adenitis is often bilateral, and numerous glands are involved. They are tender and their relation to the offending focus usually can be found in sore throats and teeth. Tuberculous glands are hard and tender, often matted in a group, and the discharging sinus is more often caseous and never the glary mucoid or milky substance seen in branchial fistula. Cystic hygroma occurs most frequently in the supraclavicular area; it is always multilocular and translucent, while branchial cysts are always unilocular and never translucent. Lipomata are loculated, soft, and nonfluctuant; when palpated, they give the characteristic wavy appearance to the overlying skin.

The controversy—Of the schools of thought regarding the embryonic etiology there are two remaining which are most debated. The one group follows the thought of Rabl, who considered all lateral cysts and fistulas as originating from the branchial cleft, namely the second or cervical sinus. Among his followers are Bailey, Ladd and Gross, Malcolm and Benson. The other group is willing to string along with Wenglowski, who maintained that they are a remains of the thymic duct. Among his followers are Lahey, Meyer, Larson, and many others.

Fully appreciative of some controversial findings in both, the author remains of the opinion that Wenglowski's work is most likely to be correct and gives the following reasons:

(1) The group that follows Rabl maintains that fistulas coming from the second cleft must pass between the internal and external carotid arteries as the internal carotid crosses in the third arch. They maintain that most, if not all, fistulas do pass between the bifurcated carotids. With the first fact the author agrees, but in his experience it is the exception rather than the rule to see the tract pass between the carotids. The tract is nearly always in front of the carotid sheath in its entirety, and therefore is probably not derived from the cervical sinus.

(2) This group maintains that if Wenglowski's theory is correct, the tract should be lined with thymic tissue or at least an occasional Hassall's corpuscle, when, as a matter of fact, the lining is squamous and columnar. The author's opinion is that this reasoning is not necessarily sound, for the simple reason that thyroglossal fistulas too are lined with squamous and columnar epithelium; they are never lined with thyroid cells. The followers of Rabl do not by the same token deny the origin of this duct but are in full accord.

(3) The opponents of the Wenglowski theory refute his theory that remnants of the branchial apparatus do not occur below the hyoid, by citing a case of persistent branchial cartilage found in the lower third of a child's neck. This admittedly is damaging evidence, as is the rather rare finding of a skin tab containing a bit of cartilage resembling an ear lobule which is occasionally found in the exact location of a branchial fistula low in the neck. This is, however, no more an enigma than the occasional piece of cartilage seen in skin of the thyroglossal fistula at birth.

In spite of some rather controversial, in fact confusing, issues the author as a surgeon, not as an embryologist, is of the opinion that all in all the anatomical situation of the lateral fistulas corresponds very closely with the course of the thymic duct as described by Wenglowski.

Treatment—the author has had no experience with sclerosing substances as advocated by Cutter and Zollinger. The hazard of necrosis and marked inflammation would seem to be greater than complete surgical excision. As advised by Beck, surgical excision should not be performed on children until they are at least

eighteen months or more of age. It is a formidable procedure and one might well resort to periodic aspiration of those cysts which fill rather rapidly in these infants.

Excision is carried out under general anesthesia. Methyl blue may be injected and washed out as a preliminary. The incision may be oblique along the anterior border of the sternomastoid or multiple transverse or step-ladder incision described by Bailey, Lahey, and others. Dissection is carried upward along and under the anterior fibers of the sternomastoid until the middle portion of the posterior belly of the digastric is reached. Here the tract arches medially to enter the pharynx.

Further dissection may be facilitated by having an assistant place a finger below the tonsillar fossa. By having him push outward, the stump is cored out until it approaches the finger of the assistant. If it is possible to pass a probe through the tract at this point, the tract is severed, allowing only a sufficient amount to remain for anchorage to the probe with a stitch. A mouth gag is placed, the probe carried through the fistula into the mouth, anchored and pulled into the pharynx by an assistant. The inverted stump is then tied intra-orally. A 100 per cent assurance against recurrence is thus reached. If the probe cannot be readily passed, we have found it satisfactory to ligate and excise the stump at a point where the assistant's finger has been reached. A small split drain is inserted for drainage for twenty-four hours, and closure is made in the usual manner.

SUBMAXILLARY AND SUBLINGUAL CYSTS

Cysts occurring in this area are often difficult to classify. Cysts not due to mechanical blockage must be considered as congenital. They are occasionally seen in infants. They have been variously described as due to an incomplete union of the first two arches in the midline, and as being due to a sequestrated salivary gland. Some, if not the majority, are branchial cysts. A fistula of a submaxillary gland following excision of a thyroglossal cyst has recently been reported by Jenkins. The author has recently excised a submaxillary cyst on a child, who elsewhere had previously a ranula on the same side treated successfully in the classical manner. The thin submaxillary cyst however, ended in a stalk, which was traced to the location of the previously successfully treated ranula. Treatment consists of total excision.

AURICULAR SINUSES

Small fistulous openings are occasionally seen on the ear or just in front of it. These may be true branchial clefts coming from the first branchial groove. The author has reported one such case, in which bilateral aural fistula were accompanied by bilateral branchial fistula. Both ended in the vicinity of the tympanic cavity. The ear, however, is formed from six small nodules, and it is very possible that incomplete fusion of these adjacent nodules may account for these sinuses.

Many of these sinuses give no trouble. Others are subject to intermittent or continuous infection. They are invariably lined with squamous epithelium and do contain vestiges of skin, i.e. hair follicles, sweat glands, and sebaceous glands, which become the seat of periodic infection. Treatment consists of careful dissection of the entire tract.

CYSTIC HYGROMA

Cystic hygroma is caused by an anomalous development of the lymphatic system. The studies of Goetsch indicate that it originates from sequestration of primitive lymphatic sacs lacking the usual communicative channels. Although they may occur in any part of the body, they are usually seen in the supraclavicular area.

Although benign they possess a peculiar property of invasion of the deeper structures of the neck, the mediastinum, or even the axilla. In contradistinction to branchial cysts, they are always multilocular, and are thin-walled and translucent. They are quite soft and not tender. Diagnosis is usually made from the location and the multilocularity.

Surgical excision is the treatment of choice, but because of the cyst's invasive nature, this may be difficult, and incomplete excision is seen not infrequently. Preoperative radiation by radium or x-ray has been advocated to facilitate excision, while others have announced results by radiation alone. Radical excision seems to be the method of choice, but the operating surgeon must here be prepared to go way beyond what he sees on the surface.

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LIFE INSURANCE FOR DIABETICS

Recently a novel tribute was paid to the medical profession. The controlled diabetic who adheres diligently to his diabetic regimen and who cooperates with his physician may now obtain life insurance. Policies are available to persons under sixty years of age who, in spite of their diabetes, carry on their work and follow the doctor's orders. Only one company writes this policy. The rates are $10.00 a thousand higher than ordinary policies. Perhaps there is no better evidence than this of the progress the profession has made in controlling diabetes.

Diverticulitis

A Brief Consideration of Etiology, Diagnosis and Treatment

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The presence or formation of diverticula in the colon does not necessarily mean that in or around such subserous mucosal herniations inflammatory reaction, or diverticulitis, will occur. Diverticulosis of the colon, per se, to my knowledge does not produce symptoms; therefore it requires no treatment. Many times, at necropsy performed on the bodies of persons who were aged at the time of death, the colon is found to contain myriads of diverticula, and yet no history has been recorded of a disorder of the bowel having occurred during the patient's life. Therefore I may say that such diverticula do not cause difficulty unless they become the site of an inflammatory process or diverticulitis which often produces thickening of the wall of the involved segment and distinct narrowing of its lumen. The management of diverticulitis frequently presents difficult and perplexing problems to internist and surgeon alike.

ETIOLOGIC FACTORS

It would seem that the sequence of events which produces diverticulitis is as follows: Diverticula are probably first formed by contractions occurring simultaneously distal and proximal to a normal bowel segment. Increased tension which is created in a normal segment by the above mechanism causes herniation of small portions of the mucosa through the wall of the bowel at areas of least resistance; such sites are said to be situated where blood vessels pierce the wall of the bowel. Diverticulitis ensues when these herniations become infected.

There are two reasonable explanations for the occurrence of obstruction in association with diverticulitis: First, colonic diverticula frequently become filled with fecal material that forms a spheroidal mass too large to pass backward into the lumen of the bowel, thus bringing about obstruction. Second, if certain pathogenic coliform organisms are present, a localized infectious process ensues. This infection probably produces small abscesses in the mucosa of the wall of the mucosal hernia, permitting the inflammatory process to extend in varying degree to the wall of the functioning part of the bowel itself, thus producing a thickened, phlegmonous, narrowed, tubelike structure. Often partial or complete obstruction of the colon ensues.

THE COMMONEST SITE AND THE POSSIBLE COEXISTENCE OF CARCINOMA

The commonest site of diverticulitis is the sigmoid portion of the colon. The acute inflammatory process in this portion of the bowel is frequently referred to as "left-sided appendicitis." Not infrequently only a small segment of bowel is involved in this process. In such

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instances it is paramount to rule out the possible coexistence of a carcinomatous lesion. Diverticulitis is not a precursor of malignancy, but the two entities do occasionally occur concomitantly in the same segment.

The differential diagnosis between carcinoma and diverticulitis is usually not difficult to make. Malignancy, as a rule, produces a crescent-shaped defect on roentgenographic examination. A typical deformity resulting from a neoplasm of the colon is revealed roentgenologically when the involved portion of bowel is distended with an opaque enema. A typical relief pattern is revealed after the opaque enema has been expelled. Diverticulitis of the colon is characterized roentgenologically by a narrowed, serrated pattern with numerous colonic pouches or diverticula. Clinically, diverticulitis produces symptoms of an acute inflammatory process. Carcinomatous lesions of the bowel, unless they are of a perforating nature, produce no local sign of inflammation. Noticeable bleeding from the bowel is a common symptom of carcinoma; it rarely occurs with diverticulitis.

CLAUDE F. DIXON

THE coexistence of malignancy and diverticulitis may tax the diagnostic acumen of the physician. Here the expert roentgenologist is of great aid. Usually he is able to determine whether or not a malignant growth is present. Since in cases of diverticulitis the mucosa remains normal for the most part, neoplastic change can be assumed or suspected if this inner layer of the wall of the bowel presents a defect on roentgenologic examination.

NONSURGICAL TREATMENT

Diverticulitis often can be treated satisfactorily by nonsurgical measures, particularly if the process involves a relatively short segment of bowel. Such treatment consists of rest in bed and administration by mouth of the following: sulfasuxidine, 6 to 8 gms. (90 to 120 grains) daily; tincture of belladonna, minims 15 (about 1 cc.) three times a day after meals; and mineral oil, ½ ounce (about 15 cc.) twice a day. In addition, irrigations of warm physiologic saline solution are given by rectum once or twice daily, and hot stupes, or diathermy, are applied over the abdomen at the site of maximal tenderness. This type of treatment, plus a bland diet, often aids in bringing about recession of the acute process, thus obviating, at least for the time being, surgical intervention.

SURGICAL TREATMENT

Diverticulitis of the sigmoid portion of the colon may cause the diseased segment of bowel to become adherent to an adjacent structure, often to a hollow viscus such as the intestine or urinary bladder. This is brought about by one or more inflamed diverticula first becoming adherent to the urinary bladder or intestine, and after this a small, walled-off abscess is formed, which digests the wall of the bladder or intestine, thus forming a fistula. Such a communication between sigmoid and ileum may not produce discernible symptoms. If, however, there is a fistula between the colon and the bladder, gas and feces are passed through the urethra. When such a vesico-intestinal fistula is present, great pain may occur

during micturition, due to severe infection of the urinary tract, together with passage through the urethra of fecal particles and a varying amount of gas. According to my experience, fistulas of this nature never heal spontaneously but require surgical treatment for their correction.

Sigmoidovesical fistula—In the surgical management of sigmoidovesical fistulas, I have adopted a three-stage procedure. First, a transverse loop type of colostomy is performed through a small, transverse, upper abdominal incision. Second, after three to six weeks have elapsed, the abdomen is explored again through a low left rectus incision, at which time the diseased segment of colon, together with the involved portion of the wall of the bladder, is resected. The opening in the urinary bladder is closed, and a suprapubic vesical stoma is established, to be maintained for twelve to eighteen days; at the same time, continuity of the colon is re-established by means of end-to-end anastomosis. Third and finally, after another period of waiting (three weeks or longer, depending on the patient's condition) the stoma in the transverse colon is closed, the colonic spur, as a rule, having been previously destroyed by the application of clamps. This three-stage procedure is time-consuming but, according to my observations, it is highly successful; the mortality is almost negligible.

Diverticulitis of the entire left portion of the colon—As has been said earlier, the commonest site of diverticulitis is the sigmoid. In my experience, this process is limited to the sigmoid portion of the colon in nearly 80 per cent of cases. Nevertheless, it should be kept in mind that in some of the remaining 20 per cent of cases a more extensive process involves more than this viscus, or else the primary lesion occurs in segments of the colon other than the sigmoid. Not infrequently the entire left portion of the colon is involved by diverticulitis. In such instances, nonsurgical management, although worth a trial, may be of little or no value, and surgical intervention is in order.

First, loop colostomy is performed in a normal or a healthy segment of bowel proximal to the diseased portion. Usually the stoma is made in the transverse colon. This shunting of the fecal current may cause the inflammatory process in the distal, or diseased, segment of bowel to subside. Abatement of the extensive diverticulitis can be expedited by daily irrigation of the left half of the colon with warm physiologic saline solution introduced through the distal stoma of the colon. In cases of this nature, closure of the stoma obviously depends on whether or not the obstructive phenomena in the left colonic segment disappear.

IF IMPROVEMENT is effected by the above measures, it will be quite obvious from the increased ease with which irrigations can be carried out. It also will be evident in roentgenograms if comparison is made with initial similar films; that is, the lumen of the bowel will have increased in diameter and the acute inflammatory process above the diverticula will have subsided. As a rule in such cases, the colonic stoma should not be closed until one or two years have passed. In elderly or debilitated patients, two to four years should be allowed to elapse before continuity of the bowel is re-established.

If the above methods of management fail and resection of the diseased bowel is deemed advisable, either of two procedures may be considered. It may be possible to resect the left half of the colon and anastomose the splenic flexure and rectosigmoid; or ileosigmoidostomy or ileorectosigmoidostomy can be done and then, subsequently, subtotal colectomy can be performed.

Diverticulitis of the entire colon—According to my experience, diverticulitis of the entire colon is rare. In five such cases I have operated in the following manner. First, an ileorectosigmoidostomy was performed. The ileum was divided about twelve inches (30.4 cm.) from the ileocecal juncture. Both ends were inverted and then side-to-side anastomosis was made between the proximal portion of ileum and the rectosigmoid. This procedure was carried out by means of an incision through the lower

part of the left rectus abdominis muscle. Second, a subtotal colectomy was performed two to three weeks later, through a long, oblique, abdominal incision extending from the right costal margin to the left superior iliac crest, dividing both rectus muscles. The colon was divided and reinverted in close proximity to the site of the ileorectosigmoidostomy.

Rectal diverticulitis—This condition is rare but it does occur. In the three or four cases that have come under my observation the disease had been previously diagnosed as carcinoma or as stricture that was thought to be secondary to lymphogranuloma inguinale. Rectal diverticula which become inflamed may cause perforation and may produce perirectal abscess. Such conditions are the cause of excruciating pain. They require drainage of the abscess through a perineal approach and also colostomy performed through an incision in the inguinal region or through the lower part of the left rectus muscle. Subsequent irrigations through the distal segment with warm saline solution are of great benefit. Rectal diathermy also is of much value.

The diagnosis of rectal diverticulitis may be difficult to make. Digital examination reveals a phlegmonous or indurated mass partially or completely encircling the rectum and marked secondary narrowing of the rectal lumen. The mucosa feels normal. Proctoscopic examination in such cases discloses a narrowed lumen with the mucosa normal in appearance; in some instances pus may be seen to exude from a single or from multiple diverticula. My experience with rectal diverticulitis indicates that the colonic stoma should not be closed in less than eighteen months.

Cecal diverticulitis—Disease of this nature in the cecum is extremely rare. Few cases have been reported. In two of the cases I have seen the pre-operative diagnosis was acute appendicitis, and in another case a carcinoma was thought to be present. A single diverticulum of the cecum can be removed and the base inverted. If one or more diverticula produce marked typhlitis, resection is in order.

SUMMARY OF IMPORTANT MATTERS RELATIVE TO DIAGNOSIS AND TREATMENT

Diverticulitis of the colon produces perplexing problems. Although the disease is not a precursor of carcinoma, it must be kept in mind that a malignant process may occur in a segment of bowel in which diverticulitis is present. If the lesion is not within reach of the proctoscope, roentgenographic studies must be depended upon to distinguish one from the other. A crescent-shaped deformity is typical of carcinoma that is producing ulceration of the mucosa, whereas a serrated appearance of the shadow of the colon is characteristic of diverticulitis. It is to be remembered that bleeding occasionally occurs in cases of diverticulitis and that therefore bleeding is not a positive indication of a concomitant or coexisting malignant growth. The passing of gas and feces through the urethra is the commonest subjective symptom of diverticulitis accompanied by perforation into the urinary bladder.

Nonsurgical management should be tried in those types of diverticulitis in which it offers hope of cure. Surgical management of diverticulitis of various segments of the large bowel, according to my experience, is carried out most safely in multiple stages.

Ocular Changes in Relation to Internal Diseases

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THE JOSEPH SCHNEIDER FOUNDATION EYE PRESENTATION

The ocular conditions that may be related either directly or indirectly to the presence of an internal disease are so numerous that in the course of an examination the methods used for collecting diagnostic evidences of disease in the eyes differ very little from those employed in other conditions. In many instances, the ocular condition, when present, may be of great diagnostic and even prognostic importance in the management of an internal disease. For example, it is only necessary to mention the well-known diabetic retinosis; the changes in the retinal vessels and retina occurring in vascular hypertension and in the toxemia of pregnancy; the presence of papilledema with intracranial growths; the typical fundus picture with Tay-Sachs' disease in infants; and interstitial keratitis in children as a manifestation of hereditary syphilis and other diseases. In fact, the advances in medicine, together with those in ophthalmology, in recent years indicate that there is scarcely any internal disease or system of diseases which may not at some time during its course be either the cause of an ocular manifestation or accompanied by an ocular condition. True, it is not always possible to reveal or demonstrate the direct relationship between the two, but in most instances a relationship is known to exist.

Perhaps one of the most outstanding illustrations of this in recent years has been the cases of young children who are born blind or nearly blind because of the presence of focal lesions of chorioretinitis. These lesions are severe, extensive, and nearly always bilateral. They were found to be caused by toxoplasma in the disease known as toxoplasma encephalomyelitis. It was diagnosed by laboratory tests, and the toxoplasma has been found to be present in the tissues of the eye. The disease was first described as occurring in infants as a severe disseminated encephalomyelitis, the signs and symptoms of which indicate widespread involvement of the central nervous system, frequent internal hydrocephalus, convulsions at birth or soon after, and the regular occurrence of lesions in the eyes.

Perhaps the most common ocular condition associated with the acute and chronic infectious diseases is uveitis. The term uveitis is employed to include an inflammation of any portion or all of the uveal tract, that is, an inflammatory condition of the iris, ciliary body, or anterior and posterior choroid, occurring either alone or together.

Although the specific cause of this ocular inflammation in many cases remains undisclosed after thorough study, it is recognized

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that it does occur in endogenous form either as an accompanying condition or as an ocular manifestation in many systemic infections. Influenza, measles, erysipelas, typhoid fever, relapsing fever, syphilis, tuberculosis, uveoparotid fever, brucellosis, sarcoidosis, gonorrhea, and articular rheumatism are a few of the well-known infections in which uveitis is known to occur. Focal infections occurring in the nasal sinuses, tonsils, teeth, and prostate must also be considered as a possible cause of this condition. It may also result from the virus infections, principally smallpox, herpes zoster, or lymphogranuloma, and may also be a result of some of the parasitic infections.

ISAAC S. TASSMAN

It can, therefore, be readily understood that the occurrence of any form of uveitis in a patient who appears to be otherwise in good health, would indicate the need for: thorough medical history; general physical examination; special examination of the nose, throat, nasal sinuses, teeth, and urogenital systems; serological tests for syphilis; intracutaneous determinations for tuberculin sensitivity; roentgenograms of the chest; and special blood studies.

In young children congenital or hereditary syphilis may be the cause of a troublesome inflammation of the anterior uveal tract in the form of iridocyclitis accompanying interstitial keratitis. These patients may present other evidences of syphilis such as the well-known Hutchinson's teeth, saddle nose, and enlarged knee joints. These cases have been found to respond well to treatment with penicillin in addition to the local treatment. Moreover, in many communities today, active antisyphilitic treatment of the expectant mother in known cases has served to reduce the incidence of syphilitic ocular involvement in children.

Acquired syphilis may be the cause of uveitis in several different forms. It is usually a manifestation of the secondary stage of the disease in the form of iritis and iridocyclitis, although it may also occur in the tertiary stage as iridocyclitis and choroiditis.

Tuberculosis is frequently considered as a cause of various forms of uveitis, or rather it might be said that uveitis is often considered to be a manifestation of tuberculosis. It rarely occurs, however, in active frank cases of tuberculosis. The diagnosis depends chiefly on the clinical picture which is often only suggestive. Other diseases, such as sarcoidosis and brucellosis, are known to produce the same ocular lesions.

The diagnosis must include the demonstration of other tuberculous foci, either by physical examination or x-ray; however, a large number of these cases fail to reveal the presence of a demonstrable tuberculous source. The tuberculin reaction is also important and must be repeated with higher concentrations of tuberculin if earlier tests produce no reaction. In addition to local treatment, the treatment of ocular tuberculosis is directed toward improvement of the resistance and immunity of the patient, principally through general hygienic measures, diet, and general care, and also nonspecific protein therapy and removal of tissue sensitivity by the use of tuberculin. The tuberculin is administered for the purpose of desensitizing the tissues to tuberculoprotein and not to produce a perifocal reaction.

A great deal of progress has been made in recent years with regard to the knowledge of the ocular lesions occurring in the virus diseases. These ocular lesions have been classified according to the nature of the infective virus. The lesions involving the various ocular structures have been carefully studied and recognized in the various virus infections.

The diseases of metabolism, disorders of the endocrine glands, and disorders of the autonomic nervous system separately, and at times collectively, produce sudden as well as gradual ocular changes. The autonomic nervous system, in particular, has attained considerable prominence as a factor in the occurrence of pupillary changes and lid ptosis, and as a factor in the control of intra-ocular tension. Such disorders as Horner's syndrome and Adie's Pupillary Syndrome (pseudo-Argyll-Robertson pupil) are examples of dysfunction of the autonomic nervous system. Moreover, the possibility of impaired function of the autonomic nervous system must be considered as important in relation to the manifestations of endocrine disease and metabolic disease in the eyes. Such drugs as acetylcholine, prostigmin, and the sympathomimetic drugs, alone and together with their synergists, are employed regularly in such conditions as glaucoma, myasthenia gravis and others, because of their action through the sympathetic or parasympathetic systems.

The ocular lesions which occur with diabetes are numerous and frequent. Almost any of the ocular structures may be involved in the course of this disease. Sudden paralysis of one or more of the extra-ocular muscles, with resulting diplopia, is common. Sudden and frequent changes in the refractive state of the eyes, occasional corneal involvement, iritis and iridocyclitis, cataract, hemorrhage into the vitreous, and diabetic retinosis of varying degrees may occur. The sudden or frequent changes which occur in the refraction or astigmatism of a patient's eye will lead the careful ophthalmologist to suspect the presence of diabetes.

Evidences of sclerosis are found regularly in the retinal vessels of the diabetic patient. The ophthalmoscopic picture on examination is usually typical. Early punctate and small round hemorrhages may occur in the deeper layers of the retina of both eyes. These are usually accompanied by a number of small, glistening, waxlike patches scattered throughout the periphery. With progress of the disease these have a tendency to gravitate and coalesce, grouping themselves around the macular region. When the hemorrhages occur in the superficial retinal layers and are flame-shaped or linear in appearance, hypertension is probably an accompanying condition. Unfortunately, retinosis may be found in the diabetic even though the diabetes is under control.

The ophthalmoscopic evidences of nephritis are too well known to require any detailed description. When hypertension is present, the earliest sign is usually angiospasm in the retinal vessels. Linear, streaked, or flame-shaped, superficial hemorrhages are then found lying close to the vessels. The retinal exudates in nephritis are usually described as soft in appearance and of a whitish color with rather fluffy margins. The so-called star-shaped figure is found in the macular region. Perhaps one of the earliest signs is a slight edema, which can first be seen around the optic nerve head. This may increase with progress of the disease and result in marked papilledema. Both eyes are involved. Later the exudates may assume a darker or waxy appearance.

In the toxemia of pregnancy, the retinal changes may serve as an indication of the state of the toxemia and may even prove to be of diagnostic and prognostic significance. The retinal evidences are early attenuation of the arterioles with areas of angiospasm, soon followed by a moderate edema around the optic nerve head. With proper management and treatment by the obstetrician, these cases may progress no further, and more serious damage is avoided. If the condition of hypertension persists, however, it leads to further changes with the appearance of hemorrhages, exudates,

Figure 1. (Top, left) Secondary lesions on chest of patient with syphilitic optic neuritis in right eye and scleritis in the left eye.

Figure 2. (Above, center) Neurofibromatosis of the left orbit. (Note the cafe-au-lait spots on the body.)

Figure 3. (Above, right) Mother of patient in Figure 3 with neurofibromatosis. The mother shows multiple nodules over the entire back.

Figures 4. (Left, center) Scleritis of the left eye in same patient shown in Figure 1.

Figure 5. (Left, below) Exophthalmos with downward displacement of the left eye due to retro-orbital tumor.

and edema in the retina. The picture then constitutes a retinitis of the toxemia of pregnancy. This is a serious complication, which might indicate need for terminating the pregnancy.

In nearly all of the diseases of the blood, it might be said that most of the changes in the eyes are dependent on the presence of some form of anemia. In general, such changes would include edema of the optic nerve head, distention of the retinal veins, with pallor, hemorrhages and edema of the retina itself. These are all characteristic of the anemias, such as pernicious anemia, the leukemias, secondary anemia due to loss of blood, and purpura. In such conditions as lymphoma, Hodgkin's Disease, lymphosarcoma, chloroma, and the diseases involving the bone marrow with lipoid deposits in the bones of the skull and orbit as in Schüller-Christian disease, the chief ocular manifestation is exophthalmos. In others, like Gaucher's disease and Niemann-Pick disease, which might be accompanied by a mild hypochromic anemia, the eye changes are produced as a part of the generalized pathologic process.

The leukemias are nearly always accompanied by a marked anemia, usually of a progressive type. The eye changes, which are often described as leukemic retinitis, include distention and tortuosity of the veins, which are darker in color with a narrow white band on either side of the vessels, a pinkish-yellow color of the retina, retinal hemorrhages, edema of the optic nerve head, and edema of the retina. The changes in the retinal veins are probably caused by the altered blood picture. The edema present is caused by a retarded blood flow in the veins and capillaries especially, with resulting seepage of blood elements and secondary pressure on the perivascular lymph sheaths. Edema of the optic disc is also probably due to lymphatic obstruction and retarded circulation with extravasation of plasma.

The retinal hemorrhages in the leukemias are rather typical in appearance and usually present a white spot in the center. They may vary in size and shape from small linear streaks to large, massive extravasations in pronounced cases.

The avitaminoses and diseases of nutrition, many diseases of the skin, and certainly most of the diseases involving the brain and central nervous system may all produce ocular manifestations or be accompanied by ocular changes. In the first of these, the cornea and conjunctiva are usually involved, while in the latter, the optic nerve and retina are chiefly affected. Optic neuritis and retrobulbar neuritis with visual disturbances are important ocular signs in the demyelinating diseases of the central nervous system. Even diseases involving the bones of the skull and orbit are common causes of ocular changes, chiefly by causing pressure on the eyeball with resulting exophthalmos or pressure on the optic nerve. This results ultimately in atrophy and loss of vision.

A LARGE variety of ocular changes are therefore found to occur as the result of internal disease or as an accompanying condition. In many of these the relationship between the two is still far from being clearly understood. Some of these changes may in the future be explained on a biochemical basis. In some, the occurrence of ocular change may in the future be prevented or cured by similar means. Now, in many of these conditions it is possible neither to prevent nor to cure any of the known ocular changes. Structural ruins remain in the eye which preclude the possibility of vision and serve only as signs and evidences of the ravages of disease. Until now, it has only been possible to study the ocular damage from the standpoint of anatomical and pathological changes resulting in altered physiologic function of the structure. The nature of the deeper underlying process which initiates and produces the change is in most cases still obscure and does not as yet lend itself to more exact study. It is to be hoped that future advances in both medicine and ophthalmology may within a generation lead to greater knowledge in this field.

DIAGNOSTIC CLINIC

Practical Points in the Management of a Diabetic Patient

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THE PATIENT is a man twenty-one years of age who, since the age of seven, has been known to have diabetes. When his disease was first discovered treatment was instituted by diet and insulin injections three times daily. On this routine he was only fairly well controlled. From 1932 through 1936 he was admitted many times to the Cleveland City Hospital and to St. Johns Hospital for dietary and insulin regulation. In 1936 he began the use of protamine zinc insulin as well as additional doses of regular insulin. He was observed during this period of adjustment in the outpatient department of the City Hospital. The dose of protamine zinc insulin given him each morning varied from 80 to 90 units, and in addition he also received regular insulin. On this routine, with a weighed diet, he experienced many insulin reactions until his mother finally became disgusted with the unsuccessful attempts at control of his diabetes so she stopped weighing his food and quit testing his urine. She began feeding him a diet which she thought was suitable and gave him insulin in a more or less haphazard manner because she felt that he did no worse on her method of treatment than he did on that previously prescribed by physicians.

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In 1938, at the age of thirteen, he developed convulsive seizures which were thought to be due to hypoglycemia. Additional study and investigation led to a diagnosis of idiopathic epilepsy. The seizures were reasonably well controlled by administration of phenobarbital and now occur at infrequent intervals. In November, 1945, a persistent upper respiratory infection was followed by loss of weight, chest pain, cough, fever, and general malaise. On April 15, 1946, he was admitted to the Cleveland City Hospital with far advanced pulmonary tuberculosis. The roentgenogram showed a large cavity at the base of the left lung and scattered disease in the right lung. Since his admission to the City Hospital he has been treated with artificial pneumothorax on the left which has practically obliterated the cavity in the lower lung but there has been some spreading of disease in his right lung. Since this admission his diabetes has been poorly controlled because of variables in his diet, frequent changes of his insulin dosage, and because of his infection. In addition to his pulmonary tuberculosis he has a marked impairment of vision due to a severe diabetic retinopathy.

At present he is on a diet of C-280 gm., P-125 gm., and F-180 gm. His insulin dosage has been quite variable and his diet is none too well regulated. His diet will now be weighed and an attempt made to control his glycosuria by giving a mixture of a solution of zinc insulin crystals and protamine zinc insulin in a proportion of

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two parts of zinc insulin crystals to one part of protamine, with supplemental doses of zinc insulin crystals if needed.

This patient illustrates some of the difficulties encountered in treating a young patient with severe diabetes where control of the disease by diet and insulin is not established early. He is an example of how easy it is for a diabetic and his family to become discouraged when good control is not established. The complications of diabetic retinopathy and pulmonary tuberculosis have made the problem of diabetic control for this patient more difficult, yet they have accentuated the necessity for better control than he now has.

Today diabetes mellitus is one of the few diseases which can be treated scientifically and with mathematical precision. During the past twenty-five years much progress has been made in treating this disease. Success has crowned our efforts so that the life expectancy of diabetic children has been greatly prolonged, and the dread of diabetic acidosis and coma has been banished from the controlled diabetic except under most unusual circumstances. The attainment of such excellent results is due to widespread use of easily acquired knowledge of the disease by those who have it and by physicians who treat it.

Within the limits of this paper I cannot cover all the practical points which years of experience have impressed upon me in treating patients with diabetes. No claim is made for originality in the suggestions which I shall offer. Neither am I participating in many of the controversial discussions one hears on the treatment of diabetes, such as the use of unrestricted diets, the question of constant aglycosuria, what kind of insulin is best, how to treat diabetic coma, etc. All of these are important questions and will sooner or later be settled.

THE following simple suggestions are those which my patients and I have found most helpful in the management of the disease.

1. When a patient is found to have a substance in the urine which reduces Benedict's solution it is necessary to determine whether he has diabetes mellitus. This decision is arrived at by obtaining an accurate history, doing a physical examination, and employing laboratory tests. Is the substance in the urine glucose? Many substances other than glucose reduce copper solutions. Determine whether the reducing substance is glucose. A simple test to demonstrate the presence or absence of glucose in the urine is to add a small amount of yeast to a test tube of suspected urine, mix, invert the test tube containing the mixture over a vessel containing a small amount of water, but sufficient to cover the end of the tube. Allow it to stand a few hours. If the substance is glucose, fermentation will occur and gas will appear in the upper part of the inverted tube.

Having determined that the substance excreted in the urine is glucose, one must next determine whether its presence is due to the inability of the body to metabolize and store carbohydrate normally or is due to the inability of the tubules of the kidney to reabsorb the

DIAGNOSIS OF DIABETES

OUR RULE

Until proven otherwise, consider as diabetic any person with sugar in the urine.

But... proceed systematically to establish correct diagnosis.

Because.. 13 percent of 17,500 patients referred for diagnosis or treatment of diabetes were found to have a non-diabetic melituria.

LABORATORY STANDARDS

GLYCOSURIA + *HIGH BLOOD SUGAR*

Related to diet

FASTING..... 0.13 % or more (venous)

(or)

AFTER EATING OR GLUCOSE.. 0.17 % or more (venous)

STEPS IN DIAGNOSIS

1. At first visit, random tests for sugar in blood and urine;

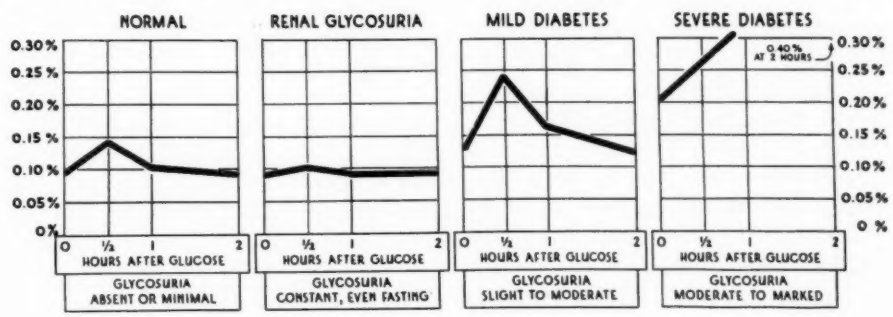
   If inconclusive, then

2. Similar tests one hour after food or glucose.

   If still inconclusive, then

3. Glucose tolerance test.
4. In melituria with normal blood sugar, exclude pentose, levulose, lactose.

TYPICAL BLOOD SUGAR TOLERANCE CURVES



BE CRITICAL: *The glucose tolerance test is an abnormal procedure, influenced by*

1. Age 2. Previous diet 3. Previous insulin 4. Infections, especially with fever.
5. Non-diabetic conditions: pregnancy, arthritis, endocrine disorders, cancer, liver disease and others.

Charts from: Diabetes In The 1940's (George F. Baker Clinic, Boston and Metropolitan Life Insurance Co., New York).

sugar normally filtered through the glomeruli. This problem can be solved by doing a glucose tolerance test or a modification of it. The fasting blood sugar should be between 80 and 100 milligrams per cent, and one hour after the carbohydrate meal the blood sugar level should not rise above 140 or 150 milligrams per cent. If there is a constant glycosuria, the condition is due to a lowered renal threshold for sugar excretion and is a benign renal glycosuria requiring very little treatment. It is not unusual in the course of a year to find one or two patients who have been treated for diabetes because a reducing substance occurs in their urine, but who on further investigation have been found to have renal glycosuria. Should the blood sugar level, after a large carbohydrate meal, reach 190 to 250 or more milligrams per cent and maintain this level for two or more hours, the condition is diabetes mellitus.

2. The prescription of diet is undoubtedly the most important single treatment which can be recommended for a patient with diabetes. For this reason every effort must be made to acquaint patients with the various types of food which will be useful in treating their disease, and approximately the content of most common foods which they normally consume. When a patient is told that one slice of bread will yield on digestion three teaspoonfuls of sugar, this is impressive, when they are told that one-half of a head of lettuce will yield less than a teaspoonful of sugar, this is also impressive. For reasons such as this all diabetics are sent to the diet kitchen and each one is given instruction in the basic and fundamental facts of dietetics. They learn to weigh and measure their food, and they learn the carbohydrate, protein, and fat content of most of the common foods they will consume. They are also taught what foods can be substituted for those on their diet when some of the foods are not obtainable.

There is no better or more helpful training which can possibly come to the younger diabetic than the experience gained in weighing foods. While diets are quite liberal, the advantages of following a dietary prescription is reflected in the treatment of a diabetic just as other prescriptions as to exercise and body hygiene are beneficial. With some patients, measuring food must be substituted for weighing it, but even with these patients great care is exercised and the importance of following a prescribed diet is impressed upon each one.

3. Dietary prescriptions vary with the age, height, weight, occupation, and general physical condition of the patient. It is always desirable to feed a patient a sufficient amount of food to prevent hunger and to supply the caloric needs of his body. A diet for the majority of diabetics will vary from carbohydrate 150 to 250 grams, protein 80 to 100 grams, and fat 50 to 150 grams. The fat diabetic is reduced in weight and the thin diabetic brought up to within 10 per cent of a standard weight for his age and height. The prescribed diet is divided into three approximately equal meals served at 8 A.M., 1 P.M., and 6:30 P.M. Regularity in the time of serving meals is of very great importance in regulating the dose of insulin. Between-meal feedings are not given except to children and exceptionally to those patients difficult to maintain in an aglycosuric status. Patients and members of the family are taught variables in the diet which must be followed when an unusual amount of exercise, such as the indulgence in sports or other physical activities takes place. Children who enter these activities are always provided with extra carbohydrate before the contest begins and perhaps supplemental doses of carbohydrate during the contest.

DESPITE the fact that most patients become proficient in weighing and measuring their food allowances it is comforting to me to know that many of them, despite this efficiency, continue to weigh their food for a long time after their proficiency is well established.

In some diabetics it is necessary to divide the diet into unequal proportions, such as 20 per cent of the prescribed diet for breakfast, 40 per cent of it at noon, and 40 per cent at night, or more rarely to give 20 per cent of the allow-

THE DIABETIC DIET

IT IS FUNDAMENTAL — PLAN IT FOR A LIFETIME

Learn Values for Carbohydrate, Protein and Fat in a Simple Basic Diet

FOOD	DAILY PORTIONS	GRAMS, *EACH* PORTION				GRAMS, *TOTAL* PORTIONS		
		WEIGHT	C	P	F	C	P	F
BREAD, whole wheat	3 slices	30	18	3		54	9	
OATMEAL	1 large	30 dry	20	5	2	20	5	2
ORANGE	3	150	15			45		
VEGETABLES, 3 - 5%	4	150	5	2½		20	10	
MILK	¼ pt.	120	6	4	4	6	4	4
CREAM, 20%	¼ pt.	120	4	4	24	4	4	24
EGG	1			6	6		6	6
MEAT	2	60		16	10		32	20
BUTTER	3	10			8			25

EXAMPLE

GRAND TOTAL GRAMS — C150 P70 F80

Calories per gram — ×4 ×4 ×9

TOTAL CALORIES ~ 1600 = 600 + 280 + 720

APPROXIMATE EQUIVALENTS

10 gm CARBOHYDRATE — provided by:

- 1 small orange (100 gm)
- ½ banana (50 gm)
- Potato size of egg (60 gm)
- ½ slice bread (15 gm).
- ½ saucer cooked oatmeal (15 gm dry).
- 2 large saucers 5% vegetables (300 gm).
- 1 large saucer 10% vegetables (150 gm).

VARIABILITY OF TOTAL REQUIREMENTS

Calories	25 to 70 per kg.
Carbohydrate	100 to 200 gm.
Protein	1 to 3 gm per kg.
Fat	60 to 125 gm.

High values for the *young-growing-active*
Low values for the *old-inactive-bedridden*

MINERALS & VITAMINS

The Basic Diet is Generally Adequate *

EXCEPTIONS	*SUGGESTIONS TO IMPROVE DIET*
Calcium	Children - 1 pint milk daily.
Vitamin B_1	Meat as liver once or twice weekly.
" G	
" D	Children - 15 cc. cod liver oil or equivalent, daily except summer.

* Calculations assume use of whole wheat bread, use of varied group of 3-5% vegetables, such as spinach, tomatoes, lettuce, cabbage, and meat to be lean beef

CHECK THEORETICAL DIETS WITH PRACTICAL RESULTS

ance for breakfast, 30 per cent for dinner, 40 per cent for supper and 10 per cent before retiring. Patients requiring this type of dietary distribution are those who are maintained in an aglycosuric state with some difficulty, such as the patient discussed previously.

All of us know that the majority of elderly diabetics can be maintained with a urine sugar-free and with a normal blood sugar by the prescription of diet alone. Education in dietetics is of the greatest importance to them. From the experience gained in treating diabetics for the past thirty-five years, I am convinced that those who have lived the longest with the fewest complications are those who have followed prescribed diets with the greatest faithfulness.

4. All patients are taught to test their urine for sugar and for diacetic acid. Recent modifications of copper reducing tests have made it much easier to keep informed as to the time of day the patient spills sugar in the urine. The simplest of these tests is the Clinitest or a compact testing set supplied by Eli Lilly and Company. Most patients test their urine twice a day, the first specimen voided in the morning and the last voided at night. When they are well controlled, urine tests are made about three times weekly. However, in regulating insulin dosage and diet the patient is requested to make at least four tests daily—before breakfast, before lunch, before dinner, and on retiring.

Multiple urine tests, performed during the twenty-four hour period, give information as to the effectiveness of the insulin dosage and whether there should be modification in the dose of either protamine zinc insulin or the solution of zinc insulin crystals. Tests on the urine for diacetic acid are not made routinely unless the patient feels ill or has fever, or unless the urine contains an unusual amount of sugar. Estimation of the blood sugar level is utilized more frequently in those patients whose glycosuria is difficult to control; and again after the urine is sugar-free and remains so for some time, estimations of the fasting blood sugar and of the blood sugar one hour after breakfast are occasionally made.

5. The use of insulin is reserved for those patients who cannot be maintained with a urine sugar-free, on an adequate diet, and with a reasonably normal blood sugar level. Whether one uses a solution of zinc insulin crystals, protamine zinc insulin, a mixture of the two, or globin insulin, there should always be a definite plan of procedure. The injections of insulin are best given in the morning before breakfast and are made along the anterolateral surface of one leg one week and the other leg the next week, choosing a different site for injection each day. The abdominal wall or the gluteal region may be used. The best results are obtained when the skin is grasped between the thumb and index finger of the left hand, raised slightly, and the hypodermic needle inserted straight into the skin just below the edge of the thumb. The insulin is thus injected into the subcutaneous tissue and placed where there is a uniform blood supply. The chances of leakage after withdrawal of the needle are almost nil. Each patient is taught to measure his own insulin, to make his own mixtures, and to give his own injections. In my experience it is easier to keep a patient aglycosuric with mixtures of protamine and clear insulin, and with fewer reactions, than it is to give each insulin separately. By giving both in one dose an extra injection is saved each day. Some patients, particularly the elderly diabetics, can be maintained on a single dose of protamine insulin each day without the use of regular insulin.

In preparing patients with diabetes for surgery and in supervising their management after operative procedures, it is most useful to discontinue the use of protamine zinc insulin for at least twenty-four hours before surgery, and to rely altogether on the use of clear insulin, giving this when necessary every four hours to maintain the patient in an aglycosuric state. The routine which I prescribe is about as follows: Six hours before surgery is contemplated the patient receives 20 to 30 grams of glucose in the form of orange juice and, if indicated, a small

INSULIN

PROTAMINE ZINC INSULIN - PZI - IS THE BASIC INSULIN
CRYSTALLINE INSULIN - CI - IS SUPPLEMENTARY

ADVANTAGES OF PZI

1. Treatment simpler.
2. Control better.
3. Patients happier.
4. Coma lessened.
5. Hepatomegaly corrected.
6. Lipodystrophy less.
7. Reactions less frequent and usually less severe.
8. Children grow and develop better.

ACTION

PZI - Slow and sure, persisting for 48 hours.
CI - Quick, lasting not over 8 hours.

INDICATIONS

PZI
- New patients *always*.
- Old patients *usually*, but if habituated to Regular Insulin, be wary.

CI
- With PZI, if latter alone does not give satisfactory control.
- In diabetic coma, when quick insulin is needed.

CI and Regular Insulin - RI - are practically interchangeable.

SCHEDULES (SCHEMATIC)

Give all insulin before breakfast.

NEW PATIENTS and OLD PATIENTS NOT TAKING INSULIN

1. a. First day 10
   b. Increase daily 10 until nearly sugar free on rising.

OLD PATIENTS ON RI

1. Replace RI with ¾ as much PZI

2. *If Glycosuria Persists in Late Afternoon*
   a. Adjust food and exercise.
   b. Add CI, varying with Benedict test,

e.g.

DOSAGE — PZI / CI — *Controlled by* → rising or 2nd specimen ½ hour later; late A.M. or early P.M. specimens.

℞ written thus:
PZI — 52
CI + PZI — 8 + 52

HINTS

1. Of four variables - Diet, Exercise, CI, PZI - change only one within 24 hours.
2. Keep meals constant, but vary lunches according to activities of the day.
3. Give extra insulin as CI during infections and, often, during pregnancy and surgery.
4. If a reaction is imminent on rising, give breakfast fruit with the insulin.

REACTIONS

DOMINANT SYMPTOMS

WITH PZI: Headache · Nausea · Drowsiness · Malaise

WITH CI: Hunger · Tremor · Sweating

→ **UNCONSCIOUSNESS** → **CONVULSIONS**

Treatment identical but with PZI repetition often necessary.

Prevent reactions by small lunches between meals and upon retiring.

dose of clear insulin. After surgery (depending upon the dose of insulin previously received and the nature of the surgical procedure) the urine is tested every four hours. When the urine tests orange or red we administer 10 to 20 units of zinc insulin crystals. When the urine tests orange or red we administer 10 to 20 units of zinc insulin crystals. When the urine tests brown 6 to 12 units are given. When the urine tests green 4 to 6 units, and when the urine tests blue no insulin is given. Feedings by mouth are begun as soon as conditions will permit. We do not use glucose intravenously unless there is some particular indication for it.

6. All patients are instructed what to do in the event they become ill or feel badly until they can communicate with their physician, or until the physician arrives. All diabetics who take insulin are instructed in recognizing an insulin reaction and all of them experience a reaction before they are dismissed from observation in order that they may recognize the symptoms. All diabetics who take insulin carry with them two or three lumps of sugar or two or three pieces of hard candy. They are instructed if in doubt as to whether they are experiencing an insulin reaction, it is safer to take one or two lumps of sugar, and note the effect. They are taught to follow the suggestions of Joslin if they become ill from any cause; they call a doctor, go to bed, keep warm, drink a glass of fluid every hour, test their urine, save a specimen for the doctor, and take an enema.

I can assure you that careful training of diabetics pays off a hundredfold in not only saving their own lives, but in helping to save the lives of others.

THE following occurrence illustrates the value of training and may be of interest to you. In 1923 Mary ———, a thirteen-year-old girl, was brought to Piedmont Hospital in diabetic coma. She had known of the existence of diabetes for two months. She was rescued from coma and while a patient in the hospital was instructed as I have described in diet, insulin dosage, and in methods of treating her disease. She was such a bright, happy, interested patient, so cheerful and so willing to help others, that she was persuaded to remain in the hospital for two months. During this time she became an assistant instructor in the diabetic diet kitchen, in the laboratory, and was most helpful in supervising the instruction of other patients. She was not only interested in learning about diabetics herself but equally as interested in inspiring others to do the same. Mary watched the treatment of these patients and was most helpful in their care. Upon her return home she was told to contact her physician and to demonstrate to him what she knew about diabetes and, furthermore, she was asked to see how many members of her family had sugar in the urine. She did as requested, and tried to teach her physician about diabetes, but I am afraid he was not a very apt pupil. She did find two other diabetics among a large family connection. About three months after her return home, she sent me the following telegram:

"Have just seen with Doctor ——— a patient in diabetic coma. We gave him forty units of insulin, salt solution in vein, and an enema. Advise what to do next.

(Signed) Mary ———."

7. General hygienic care is of great importance. A careful examination of the patient is most desirable in preventing complications. Every diabetic is taught to keep his body clean, to bathe daily, and to regard all infection as something which can be serious. Examination of all patients at least twice a year is most helpful in the early recognition of complications. In the young individual we are most concerned in detecting early tuberculosis, diabetic retinopathy, and cataracts. In the elderly or middle-aged group cataracts and retinopathy are not as prevalent in those who are well controlled as in those who constantly excrete large amounts of sugar, and we are concerned with the development of atheroma or arteriosclerosis leading to coronary occlusion, intermittent claudication, and at times gangrene. These are carefully sought for and when evidence is

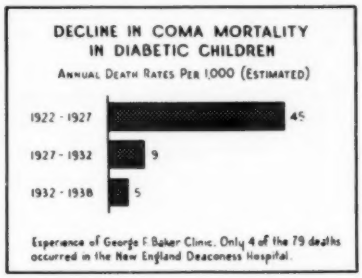
DIABETIC COMA

PREVENTABLE BUT . . . STILL THE CHIEF CAUSE OF DEATH IN CARELESS OR CARELESSLY TREATED DIABETICS

PREVENTION

Teach patients: *If you feel "sick"* –

1. Call a doctor.
2. *Never omit insulin* unless urine is repeatedly sugar free.
3. Go to bed
4. Take a cup of hot liquid hourly.
5. Keep warm
6. Get someone to care for you
7. Take an enema


DECLINE IN COMA MORTALITY IN DIABETIC CHILDREN
ANNUAL DEATH RATES PER 1,000 (ESTIMATED)
1922 - 1927
45
1927 - 1932
9
1932 - 1938
5
Experience of George F. Baker Clinic. Only 4 of the 79 deaths occurred in the New England Deaconess Hospital.

Hospitalize for CONSTANT OBSERVATION · UNINTERRUPTED TREATMENT · ADEQUATE LABORATORY AID

DIAGNOSE EARLY · TREAT AGGRESSIVELY

TREATMENT

Minutes Count! Begin At Once!

1. DIAGNOSIS – Verify immediately by tests of urine and blood.
2. "QUICK" INSULIN * On admission, 20. to 100 units, repeated every 30 or 60 minutes until clinical and chemical improvement. Total in first 12 hours varies from under 50 to over 1,000 units.
3. FLUIDS AND SALT – On admission, 1,000 – 1,500 cc. salt solution parenterally to relieve dehydration and electrolyte loss. Repeat once or more in first few hours, giving usually 4,000 to 5,000 cc. total fluid in first 24 hours
4. GASTRIC LAVAGE – To relieve distension and aid retention of fluids orally.
5. ENEMA
6. OTHER AIDS – If indicated, caffeine, epinephrine, blood transfusion and, for anuria with low blood salt, 10% salt solution intravenously.
7. COMPLICATIONS – Be on the alert, especially if fever is present or response to treatment is poor.

* Crystalline or Regular

N.B. *No Glucose Parenterally IN FIRST FEW HOURS, because*

1. Body fluids already contain *excess sugar*, utilizable if enough insulin is given promptly.
2. Advantage of blood sugar estimations as an index of treatment is lost.
3. In advanced coma, anuria may result.
4. Shock is combated best by constant intravenous infusion of salt solution.
5. Use of glucose diverts attention from insulin, fluids and salt.

INSULIN IS ALL IMPORTANT • GIVE ENOUGH • GIVE IT EARLY

found of their existence, further measures are instituted for their care.

8. The prevention of hypoglycemic reactions can best be accomplished by paying strict attention to diet and noting the time of day at which they occur. Should a reaction occur before twelve o'clock noon it is due to the solution of zinc insulin. Should it occur in the late evenings or early mornings it is due to protamine insulin. If the patient is taking only one insulin it is fairly easy to regulate the dose so that reactions do not occur. However if they are taking a mixture of both, or taking two different insulins, it is still easy to adjust the insulin dosage in the majority of patients so that reactions are avoided. In practically all of my patients who are taking a mixture of the two insulins, or who take fairly large doses of protamine insulin alone, to prevent reactions occurring in the early morning hours every patient is advised to test the urine on retiring. If the urine tests blue, depending upon the amount of insulin he is taking, he is instructed to take a glass of milk or a glass of milk and two Uneeda Biscuits. As a result of these procedures I have had very few patients experience a severe reaction at any time unless they thoughtlessly disregarded instructions.

9. The treatment of acidosis and coma occurring in patients with diabetes consists in the utilization of those methods which have been made as simple as possible and have been followed for many years. Besides the usual routine treatment of being put to bed, kept warm, and given an enema, estimations of the blood sugar, carbon dioxide combining power of the blood, and the extent of glycosuria as well as the amount of urine excreted are recorded. They are given 40 to 50 units of zinc insulin at once and the dose is then repeated every hour, fluids are administered by mouth if possible, intravenously if necessary, and subcutaneously. Glucose is not given intravenously or by mouth until there is a definite and marked fall in the blood sugar, and a diminution of the urinary sugar excretion. The important thing in my experience is to see that they receive sufficient fluids and that they receive an abundance of zinc insulin. When the blood sugar is in the neighborhood of 200 milligrams per cent they are given, slowly by mouth, liquids containing 10 to 20 grams of glucose in a six ounce mixture. If this isn't possible, then 10 to 20 grams are administered by vein, and repeated if necessary. We do not advise soda bicarbonate either by mouth or intravenously in any of our patients unless there is some reason other than coma. A solution of sodium lactate as recommended by Hartman may occasionally be useful. Circulatory collapse is best treated by transfusion, plasma, and small doses of epinephrin.

It is realized that much more can be said in the treatment of patients with diabetes which would be useful and that greater detail would be helpful. It is hoped, however, that sufficient practical points have been stressed which will be instrumental in helping you to prolong the lives of many diabetics who come under your care.

DIAGNOSTIC CLINIC

Surgical Management of Obstructive Jaundice

RICHARD B. CATTELL*

LAHEY CLINIC, BOSTON

THERE are three common causes of obstructive jaundice amenable to surgical relief. The first is the condition of common duct stones; the second, that of benign strictures of the biliary ducts, both intrahepatic and extra-hepatic; and finally malignancy occurring somewhere along the course of the biliary duct causing obstruction and jaundice.

I shall discuss two cases of common duct stones. The first patient is a 52-year-old woman who entered the hospital only recently, in September, 1946, with the complaint of jaundice. Her first symptom occurred in April, 1946, when she had intermittent episodes of nausea and vomiting without pain and without jaundice. These occurred at frequent intervals every few days. Dyspepsia also began to develop and she had an aversion to fatty foods, which is so common with stones of the gallbladder and common duct. Finally, during the month of August, obstructive jaundice developed with clay-colored stools and dark-colored urine. She had lost 30 pounds in weight.

This story, with its indefiniteness and without the colic associated with a long history of gallstones, is strongly suggestive of the presence of malignancy as well as common duct stone. The 30-pound weight loss, however, we must appreciate is an indication of reduced food intake, particularly of fats, which results in weight loss because of reduced nourishment. In our experience, in a review of patients having gallstones who are submitted to cholecystectomy, the average weight loss has been found to be 19 pounds. The large weight loss in this patient then is still consistent with the diagnosis of common duct stone.

This patient's past history is of no moment. On examination, when she was seen in the hospital, her liver was enlarged, down two or three finger-breadths below the costal margin. She had the usual studies and cholecystograms.

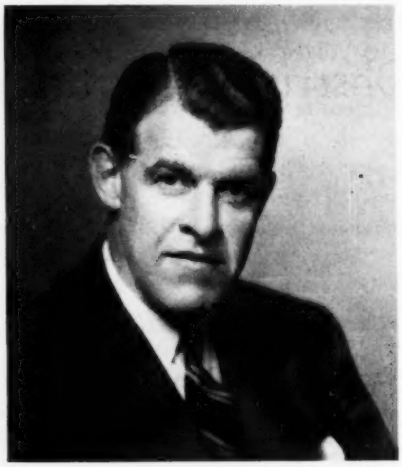
This patient's jaundice was not deep; as a matter of fact, the icterus index was only 40. The cholecystograms showed no filling. They were repeated on two subsequent occasions with similar findings. Cholecystograms are no help in the diagnosis of common duct stones. Certainly in the presence of severe obstructive jaundice we are wiser to refrain from such tests because of the enlarged liver and the effect of the dye on the liver. Cholecystograms were of no help here.

Gastroenterologic studies were done because cancer of the head of the pancreas was suspected. They showed nothing.

This patient was operated upon October 5, 1946, and I think she is an excellent example of what early ambulation, as practiced in this hospital, has done. She was out of bed in three days after the operation and to date has made an uncomplicated recovery.

At operation, the gallbladder was found to be

NOTE: Presented before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.



Photograph by Bachrach

RICHARD B. CATTELL

small and friable and difficult to remove. Fortunately, the operation was done under spinal anesthesia. In both of these cases, the operation was done under fractional or continuous spinal anesthesia, so that good operating conditions, so essential for doing all gallbladder surgery safely, were present. If most gallbladder surgery were done under such operating conditions, we would not have the tragedy of the second condition which I will discuss with you, that of traumatic injury to the common bile duct.

The second patient is 70 years of age and had his first symptoms in January of this year. He had had two previous admissions because of gallbladder colic and jaundice. His history otherwise is similar to that of the first patient.

A diagnosis was made in both patients preoperatively, in spite of negative cholecystograms, chronic cholecystitis and cholelithiasis, and operation was advised.

Both patients have had exploration of their common ducts. In surgery of the biliary tract it is essential that the common duct be explored in a large percentage of cases. In our experience, 46 per cent of patients having gallbladder surgery have their common ducts explored. In the presence of jaundice there should be no question at all unless one can determine that at the time of operation there has been a mistake in diagnosis and there is intrahepatic jaundice; under these circumstances probably the less surgery done, the better, and the common duct need not be explored. However, in gallbladder cases, 39 per cent of patients who have common duct stones do not have jaundice or an elevation of the blood bilirubin or icterus index.

THE next clinical observation we would like to make relative to these two patients is that both not only had their gallbladders removed and their common ducts drained, but both had the common duct drained with a T-tube. If a catheter is used we do not have as satisfactory a drainage of the biliary tract as if a T-tube is used. The only objection that can be offered to a T-tube is possible difficulty in removal, an experience with which we do not concur, and, second, that it may traumatize the duct more than a catheter. We believe that it is unwise to explore the common duct and attempt to close it by suture without drainage.

The first patient has her T-tube still in. The man of 70 had his T-tube removed after visualizing his biliary tract with a cholangiogram. This was done on the twelfth day. He had no common duct stones. The first patient had an impacted stone at the junction of the cystic duct and the common bile duct.

It is particularly important under these circumstances that a T-tube be left in for a considerable period of time. I think when we have had distortion of the common duct and ulceration from a stone at the junction of the cystic and common ducts we should leave the T-tube in for a considerable period until full healing and scar contraction have taken place, in order to prevent a benign stricture.

The use of cholangiograms is not a necessary routine. As a matter of fact, if we use the clin-

ical test for the removal of the T-tube in these obstructed cases — that of clear urine — being able to clamp the tube with bile passing in and getting normal-colored stools, that is sufficient without making a cholangiogram.

I should like to warn you about cholangiograms in patients who have recently had severe obstruction and who have jaundice. If the opaque medium is put in under tension (and it must be put in fairly rapidly or it is likely to pass down through the ampulla and not give you visualization), you may have liver damage and a bleeding tendency develop in spite of protection from vitamin K.

If there is severe disease of the common duct, as evidenced by thickening of the duct or particularly by change in the mucosa, then there is a real advantage in draining this for a considerable period. We have no hesitancy in leaving a T-tube in place for six months, a year, or longer, particularly for the second group of cases we will discuss, those with benign stricture.

In all patients with obstructive jaundice we have a serious problem relative to their preparation for operation. Any patient who has had obstructive jaundice for a long period has had marked physiologic disturbance of function. The first thing that is important is the use of a special diet with high protein, high carbohydrate, and absent fat. Proteins can be best given by mouth during this preoperative period rather than intravenously.

Vitamin K, which has been of such great aid to us in prevention of bleeding in obstructive jaundice, is not the only vitamin that should be used; vitamin B, the B-complex group, is very useful in improving liver function. If the patient is in quite poor condition it may be necessary to give protein in the form of hydrolyzed protein or amino-acids by the parenteral route, just as glucose may be necessary by this same means. The use of blood transfusions both preoperatively and postoperatively is essential in the treatment of these badly obstructed cases. Choline chloride is useful in improving liver function postoperatively.

THE SECOND group of patients we wish to consider, those with benign strictures, usually give a history which should point to this diagnosis. Either obstructive jaundice has developed postoperatively when jaundice was not present preoperatively, or bile has continued to drain from their wounds and they have an external biliary fistula. In this condition it is perhaps fortunate that a fistula results in a high proportion of cases, since the degree of jaundice is definitely lessened or may not be present.

We have now had experience in the treatment of 172 patients with benign strictures of the biliary tract. You will see that the cause of the benign stricture is chiefly due to operative injury—99 cases out of a group of 123 that we have analyzed being due to surgical trauma at the time of operation. Usually in these cases we have a history of trouble experienced during operation; for instance, the occurrence of hemorrhage with the application of clamps or sutures to an area of bleeding in the region of the cystic artery or hepatic duct. Fortunately for the protection of the surgeon, there is a group of patients who may develop inflammation of the extrabiliary ducts, producing benign stricture. This has a medicolegal significance in the determination of the etiology of these cases. There is a smaller group of patients with benign stricture due to fibrosis of the ampulla. These are frequently associated with recurrent common duct stone.

Of patients having operative injury, the portions of the extrabiliary ducts involved were as follows: 49 per cent had injury of the hepatic duct, either one or both; some of these had division of both hepatic ducts, others, injury of the common hepatic or removal of a portion of all three; 23 had injury in the area of the cystic duct, which implies an angulation of the common bile duct where the cystic duct has been secured; 9 only had injury down near the duodenum, and 18 of 99 patients with benign strictures had relatively all of their extrabiliary tract system removed at the time of removal of the gallbladder.

In the simplest method of repair of benign

stricture, the region of the common hepatic duct is narrowed by the application of clamps and sutures, the constricted area is excised and the large hepatic duct anastomosed to the common bile duct. It was thought that with the large group of patients encountered in many clinics it was not possible to do this type of repair in most patients, and as a result many operations were proposed, including the recent ones by Dr. Cole and Dr. Allen, of the anastomosis of the hepatic duct to the jejunum. In his earlier reports Dr. Walters stated that there are only two ways of repair: one of joining the ducts and the other anastomosis of the proximal duct to the gastro-intestinal tract. In our experience, if the gastro-intestinal tract is used, hepaticojejunostomy is most effective. It is better to use the jejunum than to use the stomach or duodenum, and diversion can easily be accomplished by entero-enterostomy.

I should like to call your attention to the fact that this type of operative procedure should not be utilized in most cases. As our experience increases in the treatment of benign stricture, we have learned that even though the distal end of the duct is not visible, duct portions can still be secured and anastomosed. This can be accomplished only by turning over the duodenum, raising the head of the pancreas, splitting it, and dissecting out the intrapancreatic portion of the common duct. This dissection of the pancreas enables one to secure an inch or more of duct and then, with mobilization of the head of the pancreas, an end-to-end suture can be done over some type of tube, either vitallium or rubber. This procedure should give the best possible result since it preserves the sphincter at the lower end of the duct.

In cases of fibrosis of the ampulla we use a long T-tube which passes all the way down through the ampulla. In exploration of the common duct one should avoid real trauma to the ampulla of Vater, yet be sure in every patient in whom the common duct is explored that the ampulla is open. This is done by graduated probes (Bâkes). If probes cannot be passed readily, a transduodenal approach may be required to open the ampulla satisfactorily. It will contract again unless a tube of some type is left in for a considerable period of time.

OF 43 PATIENTS who had 56 operations in recent years, 8 had dilatation, 2 only had plastic repair, where only a portion of the wall was involved, and 31 were operated on with end-to-end suture; anastomosis to the gastro-intestinal tract was done in 14. The latter method we believe can largely be done away with by the method I have outlined of obtaining distal duct portions.

In the two groups of 80 and 43 patients, the mortality in the first group was 17 per cent and in the second group 7 per cent. The mortality has been reduced by better preparation, particularly the use of proteins, blood transfusions, and vitamin K.

Poor results are likely to result from gastro-intestinal anastomosis. Only 12 of 21 patients so treated were well, and 8 had to be reoperated upon for the relief of recurrent obstruction.

The vitallium tube suggested originally by Pearse has now been used in 47 patients. The molded tube, which has the largest lumen of any for its size, has proved efficacious in the repair of benign stricture.

A tube of a different type which Dr. Lahey has described, is a bouncing clay tube with a flange which has a fairly large lumen. Its main advantage is that it is moldable when the duct fragments cannot be straightened into a straight line.

The third group of cases I have reported before this audience before and is that group having malignancy. The number of patients being submitted to resection in this country has increased considerably in the past three or four years. These patients have progressive jaundice, usually painless. Ten per cent of them, however, have pain and associated common duct stones. In all the cases of benign strictures without fistulas and in all of the malignant cases, there is marked enlargement of the liver, and that, to my way of thinking,

is the best indication of the severity of the obstructive jaundice. It is more valuable than any of the clinical tests that can be used, except perhaps the estimation of the retained bile salts or blood bilirubin.

A DIAGNOSIS of obstructive jaundice due to malignancy can usually be made from the history. I believe they can be distinguished clinically, based on a review of 105 of our cases in which this diagnosis was present. If obstructive jaundice is the first symptom and it is later followed by weight loss, dyspepsia, and other gastro-intestinal symptoms, particularly diarrhea, then we have carcinoma of the ampulla obstructing the lower end of the common bile duct. If our story begins with diarrhea, weight loss, anemia, weakness, and then is followed by obstructive jaundice, we are almost certain to have carcinoma of the head of the pancreas. In both of these situations the interpretation of Courvoisier's law is very important. We have an enlarged liver and we have a dilated gallbladder.

The third group has the symptomatology of either of these with obstructive jaundice, the weight loss without dilatation of the gallbladder. This is due to carcinoma of the biliary ducts, either of the gallbladder itself or of the common hepatic or common duct at the cystic duct junction. These can actually be differentiated clinically by this simple means.

Most of these patients are in such serious condition that medical measures to prepare them for operation are not very effective. It is important to relieve the obstructive jaundice. There is a tendency in this country today for surgeons who are operating upon these patients to do the operation in one stage. I think if this is done in any appreciable number it will result in a very high operative mortality. It seems to me that we should employ the two-stage operation in every patient who has severe obstructive jaundice due to malignancy.

There is a great disadvantage if the proper operation is not done at the first stage. As a matter of fact, one of the reasons some have accepted the one-stage operation is because of the difficulty that is encountered in the second stage as a result of the first stage. If a long antecolic loop of jejunum is brought up and anastomosed to the gallbladder, with or without entero-enterostomy at the first stage, we have our best means of preparing the patient for the resection by relief of obstructive jaundice. The liver may shrink up markedly during a short period of time and one can go ahead with the second stage resection within a period of fifteen to twenty-one days and know that it can be done much more safely.

The operative procedure itself I will present to you very briefly. It is necessary to remove the end of the stomach, all of the duodenum and the first part of the jejunum and the head and neck of the pancreas. The exposure is not difficult, but it is an involved dissection, since it involves so many vital structures in this area.

In the early work, as the first operation of a complete type, reported by Dr. Whipple in 1935, the pancreatic duct was not anastomosed to the intestinal tract. In my opinion, it is very important to anastomose the duct to avoid complications. We have now anastomosed the duct of Wirsung to the jejunum in 51 patients either by direct anastomosis of the pancreatic duct to the jejunum or by side-to-side anastomosis in inoperable cases.

In a one-stage operation, the common bile duct is inserted just distal to the pancreatic anastomosis. When one completes the operation in one stage, one has anastomosis of the stomach to the jejunum, the diversion procedure of entero-enterostomy, and the pancreatic and biliary tract anastomoses.

In the past five years we have had 151 patients with malignancy causing obstructive jaundice. We have done 40 resections of the type discussed, with 7 deaths, a mortality of about 18 per cent. The longest period since operation is four years and two months; this patient is still living. We have expectation of cure for malignancy with obstructive jaundice in approximately 30 per cent of cases submitted to resection.

DIAGNOSTIC CLINIC

Results of Prefrontal Lobotomy on Chronic Psychotic States

HARRY LIPSON,[1] E. W. CRAWFIS,[2] EDWARD W. SHANNON[3]
WITH AN INTRODUCTION BY LOUIS J. KARNOSH[4]

CLEVELAND, OHIO

INTRODUCTION

THE frontal lobes of man possess functions which are so inclusive, so diffuse, and so elusive that it is impossible to include them all in a simple definition. They are the front parlor, in a manner of speaking, of human personality.

Without frontal lobes the human being can still think, know, and remember the everyday things of life, but in direct proportion to the amount of loss, he cannot deliberate or contemplate, he cannot assign himself to concerted, prolonged concentration on a single, elaborate plan of action or reasoning.

The frontal lobe determines to what degree reason shall dominate emotion, how well the individual is able to draw upon his store of intelligence to dictate judgment, insight, and moral behavior. It makes possible the highest degree of reasoning in terms of the abstract and away from the emotional and instinctive.

In short, it acts as an emotional valve, dictating whether any mental process shall be utterly barren of feeling or whether it shall be charged with intense feeling; whether that mental process shall be nothing more than a passing fancy or a prolonged, intense, nerve-exhausting ordeal.

It can be argued that some people have insufficient frontal lobe function and are flighty, silly, unstable creatures of no social worth. Such was Phineas P. G., who was a fine and substantial citizen of New England before four inches of crowbar blew out his left frontal lobe. After this happened, he became the meanest and most ornery person in his community.

It can also be argued that some people have too much frontal lobe function, some of which is bad. Too much emotional charge is directed into a few isolated ideas, which means that the person's action and thinking are dominated by propelling morbid ideas to the exclusion of normal thinking. We then have obsessions and compulsions, morbid mulling and brooding, overpowering convictions and ideas of persecution, and all those monomanias that make some people chronic mental invalids, who go up the broad avenues of normal mental life to live in the dark alleys of hate, depression, frustration, and despair. In such cases, prefrontal lobotomy is not only a noble experiment but often a miraculous relief.

Let it be on record that the first prefrontal lobotomy in Cleveland was performed, not by a surgeon, not even by a physician, but by a paranoid housewife some eight or nine years

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[2]Superintendent, Cleveland State Hospital.

[3]Visiting neuro-surgeon, Cleveland State Hospital.

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NOTE: Presented before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

ago. She lived with a husband who endured her tyrannies because he was a meek, mousy, timid soul who suffered and brooded in silence and who recorded his wretchedness in a small volume which was found after his death.

One morning she shot him neatly across both frontal and prefrontal lobes. This tidy job resulted in no hemorrhage or infection. Why he eventually died the autopsy did not reveal, but for the eighteen days he survived, he lived fully the most exhilarated, liberated, and uninhibited life one could imagine. He composed songs, one of which was actually good enough to market; he devised inventions; he dictated stories to the nurses; and his blindness neither concerned him nor did it cramp his style. No more dramatic a "cure" of pipsqueak personality than this can one conceive in all the annals of psychiatry.

Of the work of Drs. Lipson, Crawfis and Shannon, I have been little more than an admiring onlooker. The remainder of this paper, therefore, will be a summary by these doctors of their most impressive and significant experiences with prefrontal lobotomy in a group of chronic psychoses.

LOUIS J. KARNOSH

HISTORICAL BACKGROUND

THE purpose of the present paper is to report on some observations on 85 consecutive bilateral prefrontal lobotomy cases, so operated upon at Cleveland State Hospital.

It is only ten years ago that Moniz first introduced the subject abroad, and less than a decade ago that Freeman and Watts started this operative procedure in this country. Yet, in that short time this surgical approach to the treatment of mental disease has been attaining increasing prominence and recognition. During the war Zeigler made a survey on the subject and learned that at that time, in nineteen different clinics in the United States and Canada, this operation was being performed upon a variety of psychiatric reaction types.

Yet these are not the first attempts at surgical treatment of psychotic states. About fifty years ago, Burkhardt, a superintendent of a small mental hospital in Switzerland, practiced unilateral multiple cortical excisions. Between 1906 and 1910, Prinisepp practiced unilateral subcortical section in the frontal region of the dominant hemisphere. These isolated instances apparently were not accepted or continued.

Freeman, who has reviewed the history of surgery for mental disorders, states that surgery has returned to the brain, after following a rather devious route through other parts of the body. For ages, surgeons have been seeking different organs that might be causing mental illness. The earliest approach was by the Greeks who directed their attack on the internal genitalia, particularly the ovaries, because of the notion that functional nervous disorders were produced by the wanderings of the uterus (hysteron) into various parts of the body. In ancient days, castration of the male was also practiced upon captives of war, and had the obvious effect of altering the vigorous and savage personality of the enemy into one of docility. Probably thousands of ovaries have been sacrificed, but in many cases, instead of alleviating mental symptoms, this surgery often

brought forth many new symptoms of discontent and misbehavior. There has been a limited amount of surgery on the endocrine system as a means of treating mental illness. Denervation of the suprarenals and implantation of grafts from the thyroid, parathyroid, testes, and ovaries have all been tried. It was not long ago that the thyroid gland was attacked because personality disorders and definite mental symptoms frequently occurred in cases of thyroid disease. Although thyroidectomy is still carried out, it should be resorted to only after complete personality studies are included with the other testing.

Focal infection as an important factor for surgical intervention in the psychoses is not such an old idea. Many such operations have been performed, based on the fact that many individuals who were suffering from serious focal infection suffered also from mental illness. Teeth, tonsils, vermiform appendix, cervix uteri have all been removed in untold numbers. Even resection of the bowel has been attempted. Often fairly satisfactory results have been obtained, and now such results can probably be explained through the mechanism of shock. Daily experience in any mental hospital shows that psychotic behavior often displays improvement following injuries, such as broken bones and even suicidal gestures.

The recent advances of physiology, especially the work of Fulton and Jacobsen, were probably utilized by Moniz. These investigators pointed out the basis of their investigations of the functions of the frontal lobes—that animals placed in frustrating situations normally become excitable, or in some instances show temper tantrums, or on the other hand, completely turn away from the problem, whereas the animal whose frontal lobes have been extirpated becomes apathetic and fails to react to the frustrating situation.

Moniz began to believe that certain types of mental disorders are the result of persisting cell-complexes of the frontal brain regions. He theorized that destruction of certain cortical areas would destroy these undesirable cell concentrations, and consequently permit a reorganization of behavior. To accomplish this cellular destruction, he first injected alcohol directly into brain tissue. Unfavorable results led him to devise his operation of bilateral prefrontal coring. Freeman and Watts devised the bilateral prefrontal lobotomy, an improvement of Moniz's operation. The operation is concerned with primarily transecting the neural pathways connecting the thalmus and frontal association areas.

HARRY LIPSON

SURGICAL PROCEDURE

This is carried out with the patient under anaesthesia induced by 5 per cent solution of pentothal sodium. Prefrontal lobotomy consists in cutting the white matter of each frontal lobe in the plane of the coronal suture. This plane passes just anterior to the tip of the frontal horn of the ventricle. The operation is carried out through a bur hole 1 cm. in diameter over the lateral aspect of the frontal lobe about 2.5 cm. above the floor of the frontal fossa. The lower part of the coronal suture can be approximated at a point 3 cm. posterior to the lateral

rim of the orbit (anterior margin) and 6 cm. above the zygomatic process. Then the approximate location of the coronal suture is outlined on the scalp with a dye.

An incision 3 cm. long is made in the plane of the coronal suture; the center of the incision is carried down through the skin and temporal muscle. With periosteal elevator the muscle is scraped back and the coronal suture is identified. A bur hole is made through the suture line to the dura. The dura is incised crucially. Not infrequently small bites are taken above and below with a rongeur in order to enlarge the opening. After hemostasis, an incision 2 to 3 mm. long is made through an avascular area in the cortex. A similar procedure is carried out on the opposite side.

A Watts-Freeman leucotin, which is about 15 cm. long, is inserted into the frontal lobe with the point directed at the bur hole on the opposite side. The instrument usually passes anterior to the tip of the frontal horn of the ventricle to a depth of 5 cm., thereby reducing the danger of lacerating blood vessels. With the surface of the brain as an axis, the point of the instrument is swung downward until the floor of the frontal fossa is touched. The point of the instrument is drawn along the floor of the frontal fossa cutting the white matter in the lower part of the frontal lobe down to the base, as far laterally as permitted by the small opening in the skull. Then, with the blunt dissector still at a depth of 5 cm., the instrument is swung upward as far as the skull will permit, care always being taken to keep in the plane of the coronal suture.

E. W. CRAWFIS

CLINICAL MATERIAL

In this series are included schizophrenias of all types, 62 patients; manic-depressive psychoses, 8 patients; involutional melancholias, 8 patients; obsessive-compulsive states, 2 patients; organic reaction types, such as alcoholic deterioration and posttraumatic psychoses, 5 patients. The length of time spent in the institution was: 3 to 4 years, 28 patients; 6 years, 17 patients; 7 years, 7 patients; 8 years, 10 patients; 9 years, 2 patients; 10 years, 5 patients; 11 years, 3 patients; 12 years, 5 patients; 13 years, 2 patients; 14 years, 2 patients; 15 years, 2 patients; 16 years, 1 patient.

Many of these patients showed not only social maladjustment but also antisocial behavior on a mean, noisy, combative, and destructive level. All these operative cases had received the various forms of shock therapy—insulin, metrazol, and electric-shock therapies; usually combinations of these were given, and several series of shocks were given, with no amelioration of the symptoms. Obviously the outlook for these patients as to remission or recovery was poor, and any postoperative change now occurring can be regarded as the result of the operation.

We used no special criteria in the selection of these cases for operation. The indications for the operation were the chronicity and malignancy of the mental processes, the pronounced antisocial behavior, the suicidal tendencies, and the failure to respond to any of the known treatments. Practically every patient had air encephalographic studies preoperatively. In

a number of instances cortical sclerosis was seen. Psychologic testing was attempted preoperatively but about one-third of the patients were too disturbed to cooperate in the testing. Considerable thickening of the dura was a rather consistent finding for the patients with long-standing psychoses, and in many of these we found a considerable collection of subarachnoid fluid at surgery.

SOME IMMEDIATE POSTOPERATIVE FINDINGS

In practically every case there is a slight postoperative rise in temperature, but there is a return to normal in four or five days. Soon after surgery there is a flushing of the face and generalized sweating. Sometimes there is slight headache and occasional vomiting and somnolence, which usually disappears in one or two days. There is some lowering of the blood pressure and slowing of the pulse rate.

EDWARD W. SHANNON

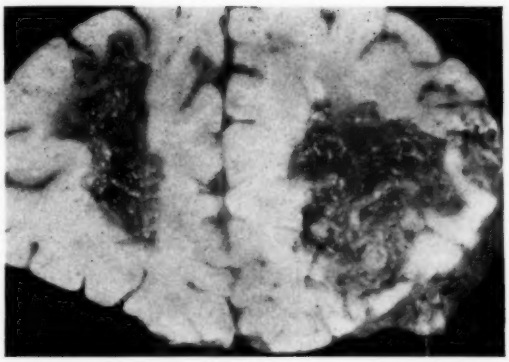
THE following are some of the neurological signs we have observed: trismus, fibrillary contractions affecting the masseter and platysma muscles, some sphincter disturbances, and transitory incontinence. The following ocular disturbances have been noted: myosis, Argyll Robertson pupils, ptosis, and occasionally nystagmus. There are some memory disturbances which last for a few days to a week and then clear up. Delusional ideas in some instances disappeared, and in other instances remained, but, with less emotional content than before. Some of the patients did not speak too well for about a week. Moniz, Freeman and Watts, and others found soon after surgery, apathy and loss of initiative, which we found in about half of our cases. In several instances we observed mutism, negativism, resistance to execution of movements, loss of facial expression, and some disorientation in time and place. These patients appeared to be in a catatonic state superimposed on the original psychotic state. But these symptoms slowly disappeared. One of these patients developed status epilepticus. None of the others has up to the time of writing this developed any epilepsy. This might occur when the advance to the frontal lobe is carried out through openings placed close to the premotor area: the resulting trauma, hemorrhage, and edema which occur may involve the motor regions and thus lead to epileptic seizures.

DISCUSSION OF CASES

There have been 6 deaths in this series of 85 operative cases. The following in main are microscopic descriptions of brain tissue of five patients who died following prefrontal operation.

Case A—Male, thirty-one years of age, white, married. Lobotomy was performed October 8, 1945. Meningitis—postoperative. Duration 44½ hours. Diagnosis: schizophrenia, mixed type. He first became mentally ill March, 1941. He began to talk strangely, heard voices, and repeatedly asked his wife if she heard "voices". He was noisy, irritable, destructive, combative, and threatening. He had had insulin and electric shock.

The autopsy findings of this man's brain following a lobotomy are shown in the accompanying illustration.

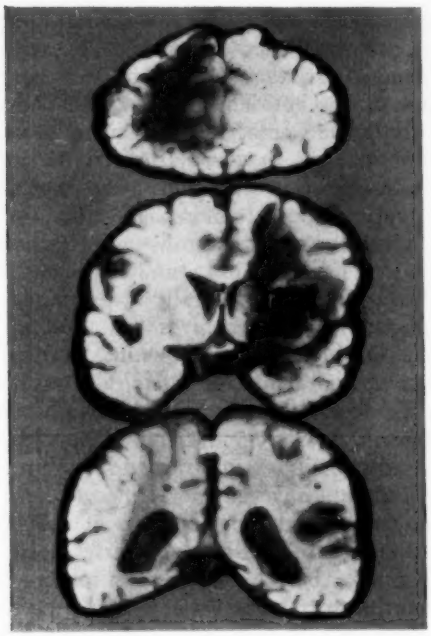


Case A. Shown here is the appearance of the necrotic tissue in the frontal lobes, the section being taken approximately through the center of the areas of necrosis. The necrosis involves the central white matter almost entirely. On the right the cortical involvement is part of the puncture wound. On the inferior surface, a little of the exudation in the arachnoid is seen. It is not as evident on these cross sections as it was before the brain was cut, however. Edema of the white matter is seen on the right just above the necrotic mass. Both areas of necrosis extend medially to within 1.5 cm. of the medial aspect of the cerebrum. The approximate sweep of the knife can be visualized by the appearance of the right lobe.

Case B—Female, fifty-one years of age, married, housewife. Prefrontal lobotomy performed December 17, 1945. She had been a mental patient since 1928. Shock therapies had been given. Diagnosis: paranoid schizophrenia.

During a mental examination she would relate some of the following facts: She insisted she was born on a ship in Gordon Park. "My father was Columbus." Frequently she would kneel and kiss the hands and feet of the different examiners. Then she would often talk about infidelities of her husband. Periodically she would appear excited, highly emotional, and very talkative.

Case C—This was a forty-six-year-old, white, married housewife who had been mentally ill since 1936 with a diagnosis of manic-depressive psychosis. She had been a State Hospital patient since 1936, although she had shown evidences of mental illness for several years, even before she was admitted to Cleveland State Hospital. She suffered from a persecution complex. She accused her husband of infidelity. At other times she insisted that her husband was trying to sever her arms and legs. On the ward she was often very argumentative, profane, irritable, and combative. She had a bilateral



Case B. The patient died several days after her lobotomy operation. Following is a description of the microscopic sections taken from the brain at autopsy. In this illustration are sections of the cerebrum taken at three levels beginning anteriorly and showing massive hemorrhage. These sections are not consecutive but were taken about every other section of the brain.

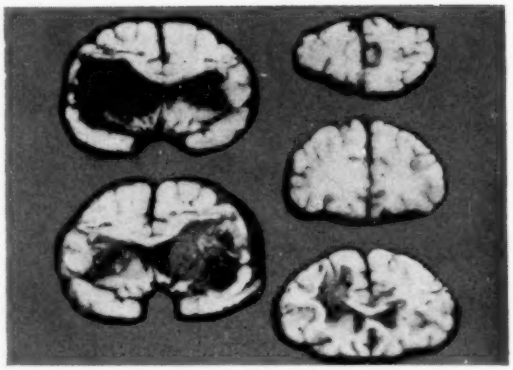
On the right side, the surgical incision was made about 1.5 cm. anterior to the incision made in the left side of the brain. Both are at the junction of the inferior and middle temporal gyri but the one on the left is a little farther back. On the right is seen the usual distribution of hemorrhage and necrosis. In the left anterior lobe there is no involvement, the involvement being farther back into the basal ganglia. The entry into the lateral ventricle is seen. There is destruction of tissue in the region of the perforating branches of the middle cerebral artery. Artery communication is seen with the subarachnoid area.

frontal lobotomy performed on November 19, 1945. A week later she developed generalized convulsions and did not respond to any medications. She died and an autopsy was performed.

The following is a short description of the microscopic findings of the frontal lobe: The incision in the frontal lobe was approximately at the same frontal plane as was found in previous prefrontal lobotomy cases. The approximate sweep in the frontal lobe was a little higher on the left. The necrosis extended posteriorly to the caudate nucleus bilaterally. The caudate nucleus, however, showed no appreciable degree of involvement. There was moderate subarachnoid hemorrhage, especially on the right side in the sylvian fissure. This patient was said to have died in status epilepticus. Bronchial pneumonia bilaterally was found at autopsy.

Case D—Male, married, white, twenty-five years old, high-school graduate. He was mentally ill for more than four years. He was diagnosed at Cleveland State Hospital as a paranoid schizophrenic. Prior to his admission to the hospital he often complained to his wife that he was not happy. He was of a jealous, suspicious, sensitive disposition. He often expressed ideas of reference and suspicion concerning his wife and also of fellow employes. He often would wander away from home, sometimes for days, and appeared quite distracted and withdrawn from reality. A bilateral prefrontal lobotomy was performed December 24, 1945. He died about seven days after surgery. An autopsy disclosed embolus in the right pulmonary artery near the hilum, which extended into the lung. The source of this embolus was not found. The cause of death was pulmonary embolism. The lesions in the frontal lobes consisted of necrosis, with hemorrhage extending back into the caudate nucleus and reaching the lateral fornices of the lateral ventricles bilateral. There was a separate small hemorrhage involving the temporal and parietal lobes adiacent to the sylvian fissure.

Case E—Female, fifty-two years old, white, married, admitted to psychiatric service April 10, 1944, with a history of the development within four weeks of fearfulness and paranoid trends. She proffered the idea that the FBI was coming to get her. She had burned all her son's clothing because she thought he was dead, and became self-accusatory, asking her husband why he had married anyone as worthless as she felt herself to be. Mental examination showed marked slowing of speech and psycho-



Case E. Sections show massive hemorrhage into the lateral horns of the lateral ventricle, the central portion of the lateral ventricles, the cerebral aqueduct, and the fourth ventricle. Subarachnoid hemorrhage can also be seen and this is most prominent in the region of the lateral cerebral fissure on the right.

The hemorrhage appears to have burrowed through the lateral wall of the lateral ventricle approximately 6 cm. posterior to the anterior edge of the frontal lobe and it has involved the following structures: the anterior limb of the internal capsule, anterior end of the caudate nucleus, putamen, claustrum, the insula, and unnamed white substance beneath the cerebral cortex. Similar structures are involved bilaterally; however, more of the white substance is involved on the right. In this area the extraventricular intracerebral hemorrhage on the right and the subarachnoid hemorrhage in the region of the lateral cerebral fissure become continuous, so that one is indistinguishable from the other.

The source of the hemorrhage cannot be definitely established but it is in the area supplied by the perforating branches of the middle cerebral arteries both on the right and the left. These vessels can be seen on the inferior edge of the hemorrhage but no definite bleeding point can be found.

motor retardation. She answered questions in monosyllables and in a very low tone. Physical examination revealed a large heart with an irregular rhythm. She maintained herself in a definite depressed state for over one year. She improved temporarily with electric-shock therapy. Patient was maintained on weekly shock treatments for about six months. Prefrontal lobotomy was decided upon.

At the time this article was written, approximately 20 per cent of the operative cases were out of the hospital on trial visit status. Brief discussions of some of these patients are given below.

Case F—Female, married, housewife, who was mentally ill for more than three years in Cleveland State Hospital. Her mental illness was preceded by many somatic complaints for about five years before she was admitted to Cleveland State Hospital. She gradually became religious, talked with God, and stated that God spoke pleasantly to her. She would often read the Bible out loud, and very often was seen in the wards to have alternate periods of overactivity and periods of mutism. When she was overactive, she was euphoric, irritable, very talkative, and easily distractible. She had had several series of shock treatments with no abatement of the above psychotic behavior. A bilateral lobotomy was performed September 17, 1945. Within six weeks she was allowed to be home and has apparently been making a fairly good social and family adjustment. She appears today neat and clean, answers questions relevantly and coherently, and shows no evidences of disturbance in her mood nor of any hyperactivity or mutism.

Case G—A married housewife, who was diagnosed as involutional psychosis melancholia. She had been a Cleveland State Hospital patient since 1942, at which time she became self-accusatory with delusions of unworthiness. Prior to this she began to isolate herself from the family. She became increasingly agitated and restless; she would not eat and could not sleep. She lost about fifty pounds in weight. She paced the floor, lost complete interest in her home, and refused to leave the house. She had several series of shock therapy, and up to the time of surgery it was necessary to spoon-feed her because of her continuous disinterest in food. A lobotomy was performed September 21, 1945.

Since her operation she has regained much of her weight, has lost her intense agitation, and is making a fairly good adjustment at home. There is still some family incompatibility between her and her husband, but superficially she shows a marvelous degree of improvement.

Case H—This patient is a forty-seven-year-old, married housewife, who was admitted to Cleveland State Hospital in 1942. Her mental illness had an insidious and gradual onset. She became more or less mute, and her husband stated she told him that neighbors were persecuting her and talking about her. She stopped going to church and became quite nervous, agitated, irritable, and depressed. She expressed ideas of self-accusation and unworthiness. A lobotomy was performed October 12, 1945. Within six weeks she returned to her home. She showed marked interest in her surroundings at the time of writing, is eating and sleeping well, denies any ideas of reference, and has no feelings of persecution, or unworthiness.

Case I—This is a single, white, high-school graduate who first was admitted to Cleveland State Hospital in 1943 at the age of twenty, having been mentally ill for some months prior to her admission. She gradually became quite restless and dull, and showed no outward emotion. Often she behaved quite catatonic, and was negativistic, mute, and inaccessible. At other times she would express ideas of reference and suspicion, and often spoke of people "having it in for her," at which time she would become quite irritable, resistive, combative, and destructive. She had a succession of shock therapies but there was no abatement of the above symptoms. Her operation was performed September 24, 1945. She speaks relevantly and coherently now, appears to have normal mood reaction, is interested in her surroundings, and

is showing some interest in her home and her environment. She had not yet returned to her work at the time this was written, but her family was quite pleased with her recovery.

Case J—This is a single, white, high-school graduate, who was admitted to a mental hospital in 1941 at nineteen years of age. There was a gradual onset of mental illness, with a complete reversal of her known normal behavior. She began to have auditory hallucinations and had ideas of reference. She imagined that people were spreading reports about her conduct. She became restless, suspicious, and gradually inaccessible. Often she would become negativistic and at other times would have outbursts of meaningless laughter. Her operation was performed October 1, 1945. Within six weeks she was home. She now appears neat and clean. She answers questions relevantly and coherently, seems fully oriented in all spheres, and appears to have a normal mood reaction. She shows interest in her home and outside surroundings.

Case K—An operation was performed on this male patient December 21, 1945. This individual had been mentally ill for more than eight years and was known to have periods when he became markedly irritable, combative, and destructive. No therapies were helpful in alleviating recurrent episodes of severe combative and destructive episodes. He is now a changed personality, appears neat and clean, goes about visiting by himself, and is able to do fine bookkeeping and accounting for which he was trained a decade before. We believe this individual is one of our better recoveries from this procedure.

ALONG with other workers, we have noted that anxiety and nervous tension have been frequently abolished as a result of this operation. That the frontal lobes are clearly concerned in emotional activity can hardly be doubted from observation of these patients. With other investigators, we feel the psychosis is not "cured" but an effective desensitization does take place which lessens the hypermotility and normal concern. We believe that this surgical procedure is indicated for certain chronic malignant psychotic states.

CONCLUSION

DR. E. W. CRAWFIS: I think the important thing we have here is that the patients have been in the state hospital for long periods of time. This type of therapy has previously been used primarily for private patients and for patients who have not been ill over such long periods. The previous indications were primarily for the involutional patients and those patients who showed impulsive and obsessive types of behavior. We have predominantly used this treatment in the impulsive type of the schizophrene, and we have attempted to control the emotionally uncontrolled behavior.

Very frankly, we say that this is still a research problem and we do not claim any definite results as yet. However, I do think, and I believe most of you will agree with me, that the fact that we have brought these patients from the back wards of our state hospitals after a period of many years certainly justifies the results.

DIAGNOSTIC CLINIC

Secondary Sex Characteristics

CONTRASTING CASES OF PRECOCIOUS PUBERTY, CUSHING'S DISEASE AND SEXUAL INFANTILISM

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THE subject of secondary sex characteristics is one which would seem to be simple. There are, however, many absorbing and intriguing angles which are beyond ready explanation. Perhaps the presentation of a few cases that show aberrations of secondary sex characteristics will help us formulate some ideas about hair and breast growth and the other characteristics that make for femininity or masculinity.

It is an oversimplification to say that the male has one, and the female another, pattern for hair growth. One finds, in routine study, a tremendous overlapping in seemingly normal women. In certain endocrine disturbances the secondary sex characteristics may be considerably altered or completely reversed.

To begin with I should like to show a patient with precocious puberty (Figure 1). Here we have a little girl who had just turned nine years of age. She had been menstruating rather regularly for the previous eighteen months. At the age of seven her breasts enlarged and pubic hair began to make its appearance. On studying a patient presenting such changes one has first to rule out granulosa cell tumor of the ovary and pineal and adrenal tumor. In this particular patient nothing to indicate such possibilities could be found. She had a mature vaginal smear, the pH of the vaginal secretions was acid (4.5), and her uterus was enlarged. Suction curettage was performed on two occasions at a one-month interval and cystic glandular hyperplasia of the endometrium was present each time.

Our first impulse is to say that this patient is producing excessive amounts of estrogen, which is true, and that the estrogens are responsible for breast growth, which I believe is reasonably correct. How about the growth of pubic hair? Are estrogens responsible for pubic hair growth? We will hold the answer in abeyance until later.

To illustrate a few other points, let us study a young woman with sexual infantilism due to hypogonadism secondary to hypopituitarism. Figure 2 shows a young lady 23 years of age who was without breast development and without pubic or axillary hair and who had never menstruated. This patient failed to respond to pituitary hormones, though this would seem to be the therapy of choice. With consecutive doses of estrogen or with a combination of estrogen and progesterone in proper sequence, this patient was given a menstrual period every month for eighteen months' time. The excellent breast development which occurred during this period of therapy is shown in Figure 3. The breast development was due to (1) the oral and parenteral administration of estrogens, and (2) the daily local application of estrogenic ointment to the breasts.

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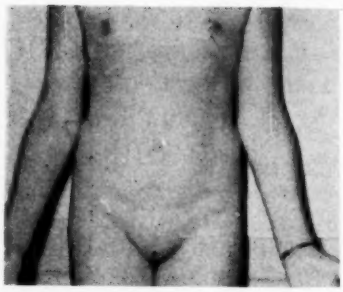
NOTE: Presented before the meeting of the Interstate Postgraduate Medical Association of North America, Cleveland, Ohio, October 15 to 18, 1946.

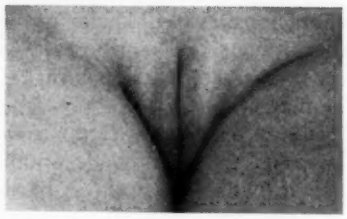
Figure 1. (Left) Precocious puberty. A nine-year-old girl with excellent development of secondary sex characteristics. Menses have been more or less regular since the age of seven years.

Figure 2. (Top right) Sexual infantilism. A twenty-three-year-old girl with complete absence of secondary sex characteristics, primary amenorrhea, and small stature. Note absence of breast development, axillary, and pubic hair.

Figure 3. (Center, right) Same patient as in Figure 2 two years later. Excellent breast growth occurred following estrogens parenterally and locally. Menses were induced by withdrawal therapy at monthly intervals.

Figure 4. (Bottom, right) Same patient as in Figure 2. Estrogens improved all other secondary sex characteristics but failed to induce pubic hair growth. Following three months of androgen therapy pubic hair growth appeared.





In spite of all the estrogens administered to this patient and the obvious improvement in her other secondary sex characteristics, growth of pubic hair failed to occur. When androgenic therapy was administered for three months, pubic hair began to make its appearance. Although androgen therapy was discontinued soon thereafter, there has been no regression of this hair growth (Figure 4).

We are trying to prove one point here—that growth of pubic hair does not result primarily from an estrogenic, but rather from an androgenic stimulus.* To further this contention I wish to discuss the case of a patient with Cushing's syndrome who had reversed secondary sex characteristics. She had amenorrhea, hypertension, obesity of the buffalo type, abdominal striae, a plethoric complexion, and polycythemia. Albumin was present in the urine. She had an enlarged heart and osteoporosis of the spine. Exploratory operation of one adrenal did not reveal any enlargement. The glucose tolerance test showed a decreased tolerance for sugar (Figure 5). The insulin tolerance test revealed insulin resistance (Figure 6). This patient was induced not to shave for about ten days and Figure 7 illustrates the beard growth which occurred during this time.

This patient—and it is paradoxical to say this—was given androgens in spite of excessive growth of hair and other masculine characteristics. Bedridden because of extreme weakness, she soon regained her strength and in a few months was able to resume her job. The main metabolic disturbance in Cushing's syn-

* For study of this point the reader is referred to the excellent article by F. Albright, P. H. Smith and R. Fraser: *Am. J. Med. Sci.*, 204: 625, 1942.

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drome is increased gluconeogenesis. The rationale for androgen therapy is that testosterone propionate spares proteins, preventing their rapid conversion into sugars, and thereby conserving protein balance. Such patients are frequently thought to have diabetes because of their decreased sugar tolerance, but this is due only to the excessive and rapid conversion of proteins into sugar.

After this patient had received testosterone therapy for several months she felt so well that she did not return to the clinic. However, it was learned that a year or two later she had a recurrence of the syndrome and died of heart failure.

I have here another example of reversal of secondary sex characteristics in a forty-year-old patient with a pseudo-adrenogenital syndrome. She is a large, strong, athletic woman who is genuinely female in her attitudes, but very masculine in her aptitudes. She has marked hypertrichosis of the chest, abdomen, and extremities. The hair growth on her face is relatively scanty. Her clitoris was somewhat enlarged. The vaginal smear showed good follicular effect. Determination of urinary 17 ketosteroids yielded normal values. Suction curettage performed on the twenty-first day of the cycle revealed a progestinal endometrium. Her glucose and insulin tolerance tests were within normal limits. The remarkable feature of this case is that she shows the typical cephalic alopecia that is so characteristic of the aging male (Figure 8).

It has been shown that the administration of androgens increases alopecia in those males who have a genetic susceptibility to such hair loss. This masculinized patient evidently is very sensitive to her intrinsic androgens and shows the same type of alopecia as do many men. Of great interest in this particular case is the fact that we have been able to induce the growth of fine tufts of hair in the cephalic region by using local applications of estrogenic ointment; application of this preparation to the face, though, caused retardation of hair growth. The results in this patient seem to bear out our point that estrogens are responsible for hair growth on the head, while androgens are responsible for secondary hair growth on the rest of the body.

THE TRUE adrenogenital syndrome differs from Cushing's in that the disturbance in the former is one of increased production of androgen, while in the latter it is one of excessive gluconeogenesis with moderate elevation of the androgen production. In the adrenogenital syndrome per se there is usually no sugar disturbance, and the patient does not have the typical decreased tolerance for sugar or resistance to insulin. The syndrome in adrenogenitalism is due to an increased production of androgens from the so-called "X zone" of the adrenals. Such females are markedly hirsute and are quite strong. The patient with Cushing's disease is weak, even though she may be large and obese. In the pseudo-adrenogenital syndrome, there may be no stigmata of endocrine imbalance other than hypertrichosis. This phenomenon probably results from an undue response of the hair follicle apparatus to normally circulating androgens.

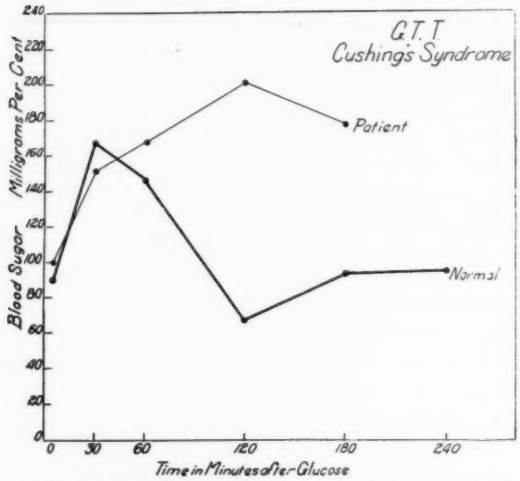


Figure 5. Glucose tolerance test in patient with Cushing's syndrome. Note diabetic curve.

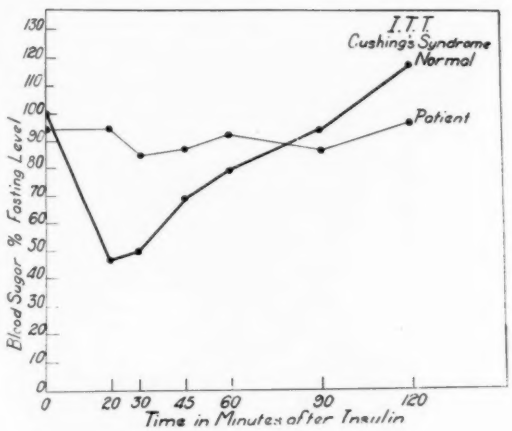


Figure 6. Insulin tolerance test in patient with Cushing's syndrome. Note insulin resistance.

Of interest are the following two cases of Cushing's syndrome and their responses to treatment. One young man showed the typical ruddy complexion of a patient afflicted with Cushing's disease. He had the typical findings: osteoporosis, petechiae, striae, hypertension, slight polycythemia, increased ketosteroids in urine, decreased glucose tolerance, general weakness, mild obesity, and so forth.

Figure 7. (Left) Beard growth in patient with Cushing's syndrome.

Figure 8. (Right) Cephalic alopecia in patient with a pseudo-adrenogenital syndrome.

He has been on testosterone propionate treatment and because he has done so remarkably, he has refused to undergo an exploratory operation of his adrenals. The other young man had the same type of plethoric complexion, striae, petechiae, diabetic glucose tolerance curve, osteoporosis, and the moderate polythemia. This patient was subjected to bilateral hemiadrenalectomy and has made a remarkable response. His plethora has disappeared, and he is capable of doing his daily work. Though he still has a moderate degree of hypertension (184/100), there is considerable improvement in his syndrome.

In another young man with primary hypogonadism the testes, not the pituitary, are at fault primarily. He showed excessive follicle-stimulating hormone in the urine, low androgenic titers, hypogenitalism, delayed bone age, marked fatigability, and poor beard growth. The improvement following androgenic therapy was remarkable. There is now increased muscle-mass, better bodily build, and an improvement in social adjustment on the part of the patient. Secondary growth of the breasts followed the administration of methyl testosterone. It seems paradoxical. It is conceivable

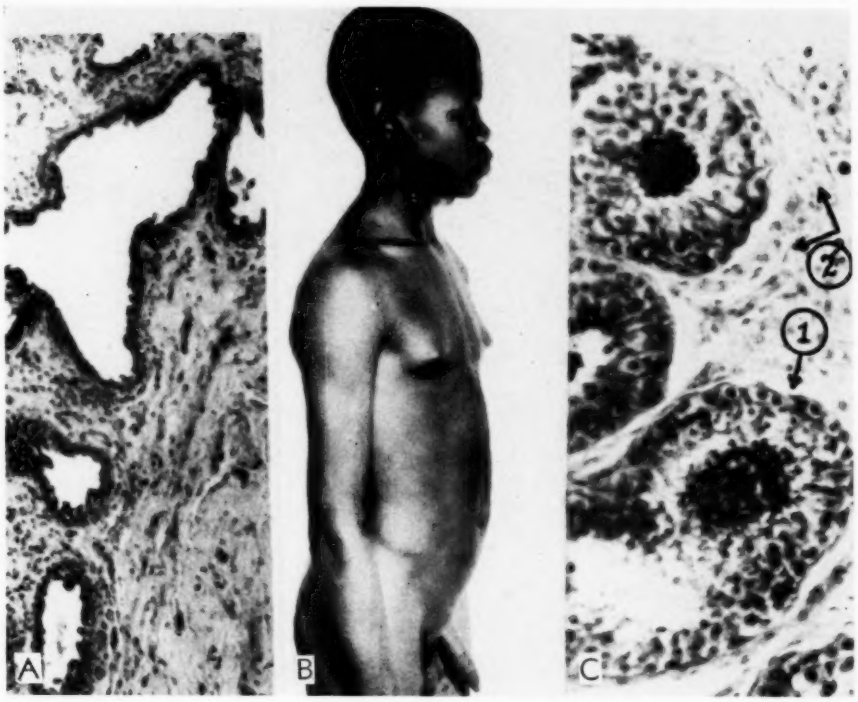


Figure 9. Adolescent gynecomastia in a negro boy thirteen years of age with well-developed genitalia (B). Breast biopsy shows duct hyperplasia (A). Testicular biopsy (C) reveals normal tubular maturation and interstitial cell development. (Reproduced from author's *Office Endocrinology* through courtesy of Charles C Thomas publisher.)

that such growth in males may occur after the administration of large doses of estrogens. This is often observed in patients with prostatic cancer receiving large doses of stilbestrol to allay the symptomatology of prostatic metastases. They complain of breast tenderness, pigmentation of the nipples, and breast hypertrophy. It appears that gynecomastia occurs in males not only following estrogen therapy but occasionally after chronic methyl testosterone and adrenal cortex administration. This is a feature which is very difficult to explain.

In contrast to the preceding case I should like to discuss two examples of young men with gynecomastia selected from a group of cases studied at the University of Georgia. One is a lad of thirteen years with enlarged breasts, in whom testicular biopsy showed normal spermatogenesis, tubular growth, and interstitial cells (Figure 9). Such breast hypertrophy is thought to be the result of an increased sensitivity on the part of the patient to his own intrinsic estrogens and is referred to as adolescent breast hypertrophy. A second example is that of a boy twenty-two years of age with gynecomastia associated with hypotubularism. Testicular biopsy revealed hyalinized tubules and an apparent—but only seemingly so—increase in Leydig cells (Figure 10).

Enlargement of the breasts may be found in males as an exaggerated physiologic response, in certain types of hypogonadism, and follow-

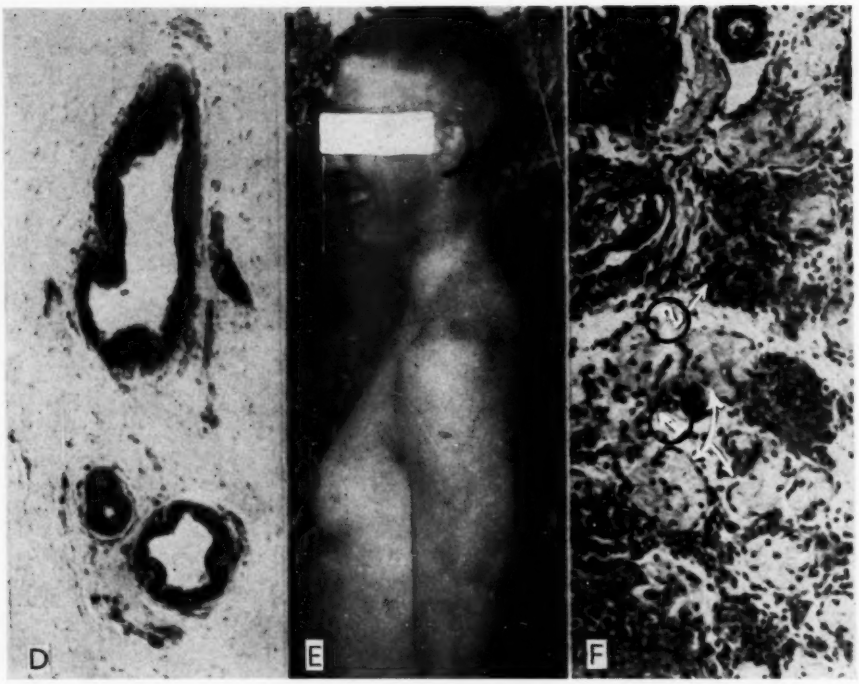


Figure 10. Gynecomastia with hypotubularism and without interstitial cell atrophy in a white male twenty-two years of age. Breast biopsy reveals duct hyperplasia with dense fibrotic stroma (D). Testicular biopsy (F) shows (1) hyaline degeneration of tubules, (2) seeming hyperlasia of Leydig cells. (Reproduced from author's *Office Endocrinology* through courtesy of Charles C Thomas, publisher.)

ing the administration of estrogens, methyl testosterone, and adrenal cortical hormones. It may also be found in cirrhosis of the liver and bronchial carcinoma.

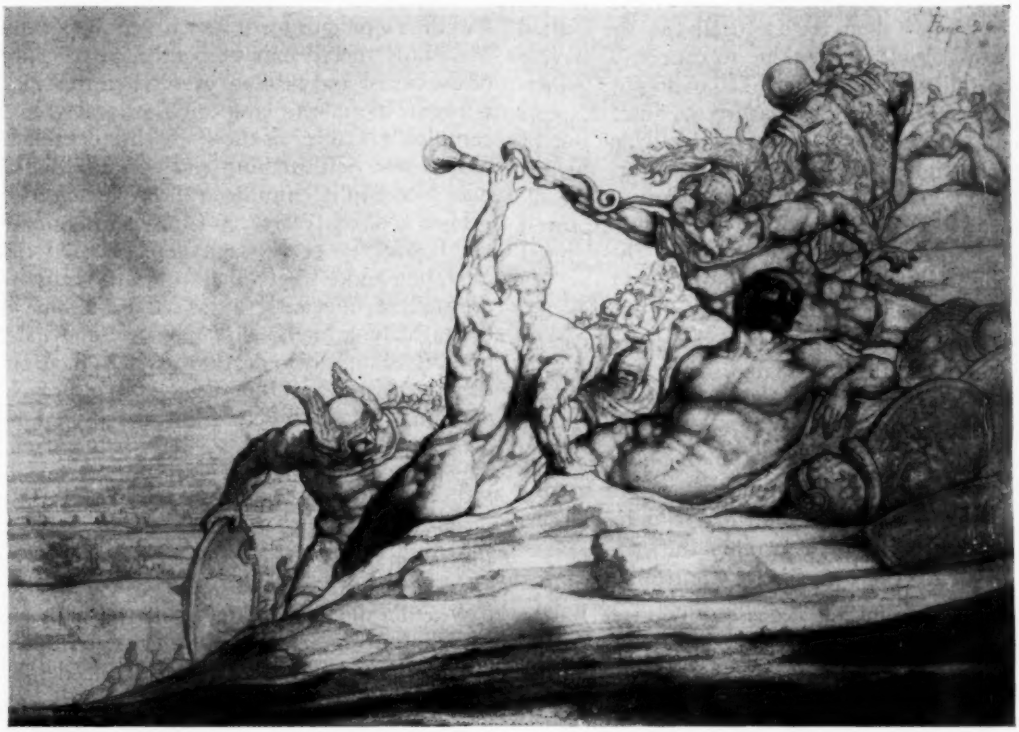
CONCLUSIONS

In discussing bodily hair distribution, reference is made to sexual and ambosexual hair. Sexual hair is that hair which is characteristic in the male; ambosexual hair is that found in both males and females. I believe that all hair is sexual and under hormonal control. With the exception of head hair, all hair on the body is the result of an androgenic stimulus. It might be hypothesized that the head-growth of hair, a feminine characteristic, receives its stimulus from the mother's estrogens while the fetus is still in utero. Females who later in life show evidence of excessive androgen production may develop cephalic alopecia if the genetic tendency is present.

What about the therapy of hirsutes and of alopecia in the female? If estrogens are applied in small doses over a long period of time to hair on the face or body, there is a retardation of growth. We have seen patients with excessive growth of hair on the upper lip and face who did not show any diminution of this growth following the parenteral administration of large doses of estrogens, but who showed retardation of growth when stilbestrol or estrogens dissolved in alcohol was

applied in small doses (one half milligram per day) over a period of several months. To help these patients, I recommend, *not* the administration of large doses of estrogens parenterally, but the local application of small chronic doses of mild estrogens dissolved in alcohol or in ointment form. In a large percentage of such cases some retardation of secondary sex hair will be noted; if applied to the scalp, it may stimulate local hair growth.

What may be done to stimulate breast growth? Complete lack of or very poor breast development is found in various types of hypo-ovarianism and is not infrequently found in women with apparently normal ovarian function. In the former group estrogens administered parenterally or applied locally will enhance breast growth. In the latter group results are from moderate to poor. In many instances it seems difficult to induce further breast growth in women who apparently already show evidence of refractoriness to breast stimulation by their intrinsic estrogens. Estrogen, particularly in ointment form, may be tried in such cases. When the results are good, the patient should be warned that complete or partial regression may set in after cessation of therapy.



Courtesy, Magazine of Art, March, 1947

THE CALL TO ARMS by William Rimmer, M. D. (1816-1879). Rimmer was a practicing physician, the first teacher of scientific anatomy in the United States, a painter, draughtsman, and the strongest sculptor of the nude in 19th century America. "The Call to Arms" is a fanciful composition, illustrating the disposition of the rectus abdominis and obliquus externus muscles.

EDITORIALS

NO. 2 KILLER

None of the basic problems of cancer has been solved. The death rate is constantly mounting. Small wonder that many doctors face cancer with a pessimism bordering on resignation. Let's look at the facts. More than 180,000 deaths in the United States last year were due to cancer. This year the toll will be greater. Today another American dies of cancer every three minutes. Experts estimate that soon cancer will kill one out of every eight persons. Except for heart disease, cancer kills more people than any other ailment. Unless the situation is greatly improved 17,000,000 persons now living in the United States will be victims of cancer.

These are grim statistics. Do they justify defeatism? We all know that the cancer deaths are influenced by two factors that reflect credit upon medicine. First, better medical care is enabling many persons to live long enough to die of cancer. Second, better diagnostic methods today enable us properly to attribute to cancer many deaths that once would have been erroneously assigned to other causes.

Actually the outlook for controlling cancer was never more promising than it is today. Cancer in most of the common sites is a curable disease, if treatment is started early enough. In the earliest stages, chances of cure are between 75 and 95 per cent depending upon the nature and location of the malignancy. If diagnosis is even moderately delayed, however, chances for cure are only a third to one-half as good. In later stages, after metastases appear, palliation is the best that can be expected.

From long experience we know that more than a third of those who eventually die from cancer could have been saved if preventive measures had been instituted in time. Surgical care of previously hopeless cancer, of the lung and the esophagus for instance, is now possible. Metastatic spread may be controlled in cancer of the breast and prostate even when treatment is begun too late to eradicate the local growth completely. Cancer of the stomach is curable by radical resection. Radium and x-ray irradiation may successfully eliminate cancer of the cervix.

Half a dozen years ago Charles Huggins of the University of Chicago demonstrated that castration and estrogen therapy would cause regression of hopelessly advanced carcinoma of the prostate, a malignancy that once inevitably progressed rapidly to death. Estrogens have also been successfully employed, notably by Ira Nathanson of Massachusetts General Hospital, for good short-term results in elderly patients with hopelessly advanced cancer of the breast. In New York Frank Adair treated female breast cancer with testosterone and obtained not only alleviation but in some cases restoration of bone tissue destroyed by metastases.

Whether hormones are palliatives only, or potential curing agents must still be determined. But the fact that hormones have considerable effect on cancer tissue has already been established. That this influence is exerted by administration of chemicals found normally in the body and is achieved by doses unharmful to normal cells is a dramatic development.

Other chemical studies are promising. The virus theory of carcinogenesis has not yet been resolved. There is some laboratory evidence indicating association of cancer of the stomach with disordered adrenal function. Nitrogen mustards have been shown to have a temporary effect in leukemia impervious to x-ray therapy. Progress has also been made in development of a chemical that will attack the enzyme system of the cancer cell in such a manner as to starve cancer cells without disturbing the nutrition of normal cells.

Cancer research is no longer fumbling, but is proceeding along well-established lines. The stage of aimless searching is over. We still know very little about cancer, but we know enough to realize how very much we could learn if only we organized our study of this disease in twentieth century fashion, in the way that rocket, radar and atomic researches were organized. The indications are, however, that there will be no single cure for cancer but instead perhaps a variety of cures for specific cancers. Until such cures are found, reliance must be placed in treatment by radium, x-ray or surgery. But these methods have their limitations. Irradiation is not always equally effective on all types of cancer tissues. And while it is relatively simple to excise a cancer in its early stages, it is another matter to remove a malignant growth that has spread over a wide area in a vital organ.

Diagnostic methods accurate in detection of female genital cancer have been developed and the mortality rate for cancer in women has been falling consistently for several years. With appropriate technics, roentgenologic examinations discover malignant changes in any organ of the body. Larynx, bronchi, esophagus, stomach, bowel and bladder may be directly visualized with endoscopic instruments.

Thus the means are at hand, but the problem is to get this information to the general practitioner. For it is evident that cancer mortality can be materially reduced if the general practitioner who sees the patient first would become more aware of the possibility of cancer and the urgent need for early recognition.

A good job of lay education has been done. The public generally is aware of the hazards of cancer, and the need for early diagnosis and treatment. Patients are coming into the physician's office for bumps and lumps on their bodies, or for symptoms that make them think they might have cancer.

The general practitioner should not be caught napping, but must realize that his office is the most effective "detection" clinic there is. This means he must think of cancer as a possibility whenever he examines a patient of middle-age or beyond. He must rid himself of a sense of defeatism toward the disease.

The need is illustrated by the experience of a large surgical clinic. Patients who recently entered the clinic with cancer of the stomach had had symptoms for eight to twelve months, and most of the patients had been under doctors' care for at least half of the elapsed time. The physicians had not examined the patients thoroughly, did not recognize the malignant nature of the particular lesion, or believed treatment useless in any case.

This is the lethargy the general practitioner must shake off. He must acquaint himself with the procedures now available for detection of and relief from malignant invasion in any part of the body. He is the key man in the fight against the nation's No. 2 killer, cancer.

M. P.

PSYCHOGENIC RHEUMATISM

FREQUENTLY patients consult a physician, often a gastroenterologist, for complaints related to stomach and bowel, and also general systemic pains and aches. They usually hope that by treatment of their indigestion their other symptoms will disappear. For the most part, however, the physician is usually unable to make a diagnosis that satisfies either himself or the patient.

The reason for this unsatisfactory situation is that the physician is unfamiliar with psychogenic rheumatism, and does not realize that the bodily aches and pains are directly related to a disturbed mental state.

During the war, many soldiers, who for one reason or another were unable to cope with the personal and environmental situations in which they were involved, escaped into illnesses which appeared to be localized in the muscles and joints. Physical examinations, however, failed to disclose anything abnormal.

Hench and Boland described psychogenic rheumatism in the May, 1946, *Annals of Internal Medicine,* as the musculo-skeletal expression of functional disorders, tension states, or psychoneurosis and considered the condition to be one of the commonest causes of generalized or localized aches and pains in muscles or joints or both.

It is necessary to differentiate psychogenic rheumatism from primary fibrositis. Effects of the latter are usually directly related to fluctuations in external environment (heat, cold humidity) while with the former, the patient reacts principally to changes in internal environment—that is, to excitement, mental distraction, worry, pleasure or fatigue.

Hench and Boland, who were active during the war at the Rheumatism Center of the Army and Navy General Hospital at Hot Springs, Arkansas, found that some 20 per cent of the patients admitted to the Rheumatism Center displayed no signs of real arthritis.

In addition to a marked divergence of symptoms described for primary fibrositis and psychogenic rheumatism, it was also found that "true rheumatics" were more cooperative in following treatment and demanded far less attention. Patients who exhibited the symptoms of psychogenic rheumatism, however, followed the pattern of the usual neurotic whose complaints are many and who attempts to monopolize the physician's time.

Psychogenic rheumatism may also be suspected when there is a history of constant pains and aches over a period of years. Fibrositic aches and pains are more likely to come and go, depending upon the environmental circumstances. A.

"FIGURES" OF SPEECH

"'Most doctors,' the radio blares, trying to sell something or other (and the radio isn't peddling stethoscopes); 'seven out of ten Hollywood stars drink or smoke or wash their faces with such-and-such; your dentist uses whatnot' (we asked ours, and he didn't). When is most? Seven out of ten is a clear-cut ratio, but how many tens were consulted, and who determines what a Hollywood star is? Don't doctors ever raise a voice in protest against the calculated exploitation of an entire profession? Are they always going to take it, like their patients, lying down?"

This quotation from a recent issue of *The Saturday Review of Literature* highlights the fact that there is no group in society with a greater stake in the authenticity underlying popular health education and advice pertaining to health than the practicing physician.

There is perhaps no single medium of communication which makes a greater impact upon the minds of both young and old than does the radio. While, so far, no serious claims are made to practice medicine by radio, the "appeal to health" has long been recognized by advertisers as one of the basic and fundamental appeals to attention.

Some of the implications of the "health angle" as it is called by the advertisers, are relatively harmless. Others are not so harmless and a few are actually dangerous. About to the degree that people take it seriously—and many do—the advice "over the air" may be dangerous.

It is highly important that the medical profession maintain an active awareness of these advertising claims based upon the self-diagnosis theory and the constant reference to undesignated doctors who "recommend" merchandise in advertising.

The whole question of medical and semi-medical advice "over the air" is one to which the medical profession should give serious attention. L. C.

This Month in Medicine

COMBINED DRUG THERAPY FOR TUBERCULOSIS

Streptomycin has been found to have suppressive value in human tuberculosis. Diasone has proved its worth in the treatment of leprosy; and animal experiments have suggested a possible role for this drug in tuberculosis. Now comes an investigation which indicates that these two drugs have a synergistic effect in experimental tuberculosis. Callomon and his associates inoculated guinea pigs with virulent tubercle bacilli. Five out of eight animals treated with streptomycin died 30-32 days after inoculation. Two out of 8 animals with diasone died within 48-49 days. But when the inoculated animals were treated with both drugs, all survived. Seven out of 8 untreated controls died with extensive tuberculosis infection 23-24 days after inoculation. The combined drug therapy was found most efficacious when started soon after inoculation with the pathogens. Established lesions were more resistant to treatment.

SUGGESTED READING

Callomon, F. T., et al.: Streptomycin and diasone in the treatment of experimental tuberculosis of guinea pigs, Proc. Soc. Exp. Biol. & Med., 63:237, November, 1946.

BLOOD LOSS IN OPERATIONS

Much good frequently derives from combinations of scientific disciplines. Recently, Baronofsky, Treloar, and Wagensteen of the University of Minnesota Medical School have combined surgery with statistics, and brought forth a better means of coping with blood losses during operations. Their technique is similar in principle to counting the horse's teeth instead of arguing about the number. The Minnesota investigators demonstrated that the gain in sponge weight is a most reliable method of estimating blood loss. The sponges used were uniform for weight, size, and dryness, hence did not have to be weighed before operation. A good weighing scale, which indicates accurately a difference of 1 gram, is essential. Thus, without interfering with the surgeon, blood loss may be observed at any stage of the operation. The sponge weight gain should be reduced by about 10 per cent, to correct for fluids other than blood, which are absorbed by the sponges. The specific gravity of blood was assumed to be 1, insofar as replacement was concerned.

Blood loss from appendectomy averaged 25.8 cc.; hernia and gall bladder procedures averaged 82.9 and 179.4 cc, respectively; colon section averaged 121.5 cc.; subtotal gastrectomy for ulcer, 499.8 cc.; thyroidectomy for diffusely enlarged gland 668.0 cc., and for nodular goiter 206.0 cc. Blood loss during radical mastectomy averaged 415.4 cc., while pneumonectomy for carcinoma averaged 1,543.0 cc.

SUGGESTED READING

Baronofsky, I., et al.: Blood loss in operations: A statistical comparison of losses as determined by the gravimetric and colorimetric methods, Surgery, 20:761, December, 1946.

IMMUNIZATION AGAINST MALARIA

The Welcome Prize Essay of 1946, prepared by Major Chiam J. Wildman, is a provocative discussion of active immunization against malaria. Wildman points out that the merozoite is the only antigenically potent form of the malaria parasites. Neither the sporozoite or trophozoite is capable of stimulating the production of antibodies. Therefore, both of these two latter forms may circulate freely in the bloodstream of malaria-immune persons, without being destroyed or neutralized by antibodies. When the trophozoites sporulate into merozoites, however, they are destroyed by specific antibodies.

The problem of active immunization to malaria, then, consists of isolating the merozoital form of

the plasmodium and preparing from it a suitable antigen. While much remains to be accomplished in this direction, Wildman states that promising preparatory experiments have already been made. The parasite has been isolated and cultivated for several generations *in vitro*. Since leucocytes phagocytize the merozoites, blood specimens from which the leucocytes have been removed are used. Trophozoites may then be cultivated in vitro, and an accurate synchronization of merozoital eruptions may be accomplished. The red blood cells in the specimen must then be rapidly hemolyzed, before they can be invaded by the merozoites. The hemolytic agent must not affect the merozoites. By centrifugation, the merozoites may now be removed from the medium. From these forms, the antigen may be prepared with which to actively immunize human beings. Wildman believes that this line of endeavor will be crowned with success, an achievement which would be a most significant contribution to the eradication of the world's most disabling disease.

SUGGESTED READING

Wildman, C. J.: Active immunization against malaria, Mil. Surgeon, 100:1; January, 1947.

SARCOMA OF THE BONE

Shallow and Wagner present an analysis of 71 cases of primary sarcoma of the bone, encountered over the past 25 years. Of this group, 35 were osteogenic sarcomas, and 8 Ewing's tumors. One of the most interesting observations was the history of trauma which occurred in a majority of cases.

The authors believe that trauma plays a significant role in the genesis of these tumors. Biopsy is the most reliable diagnostic method; and because of the danger of early metastasis, prompt radical surgery provides the best chance of cure. The prognosis is always guarded, but it is best for chondiosarcoma and fibrocoma, and next best for osteogenic sarcoma and Ewing's tumor. Multiple myeloma is uniformly fatal.

SUGGESTED READING

Shallow, T. A., and Wagner, F. B.: Primary sarcoma of bone, Penn. Med. J., 50:233, December, 1946.

CURARE

An increasing number of reports of clinical trials of curare are appearing in the literature. Myasthenia gravis is the most serious contraindication to its use. Bennett and Cash recognized this fact some years ago, and used it in the diagnosis of myasthenia gravis. Doses of curare 1/10 to 1/40 the size those required for normal mild curarization result in marked exacerbation of symptoms of myasthenia gravis. Eaton, of the Mayo Clinic, emphasizes the danger of this drug when used in conjunction with convulsive shock therapy of depressed patients who also suffer from myasthenia. He points out that ordinary curarization of such a patient, prior to shock therapy, might well prove fatal. Eaton does not discourage the use of curare in convulsive therapy. He merely suggests that the physician rule out myasthenia gravis before proceeding with its administration.

SUGGESTED READING

Bennett, A. E., and Cash, P. T.: Myasthenia gravis: curare sensitivity; a new diagnostic test and approach to causation, Arch. Neurol. & Psychiat., 49: 537, April, 1943.

Eaton, L. M.: A warning concerning the use of curare in convulsive shock treatment of patients with psychiatric disorders who may have myasthenia gravis, Proc. Staff Meet., Mayo Clinic, 22:4, January 8, 1947.

BMR AND HEART DISEASE

When the basal metabolic rate is lowered, the work of the failing heart is reduced. To achieve this lowering of the BMR, Clausen administered thiouracil to four paients with inactive rheumatic heart disease. The patients received the anti-thyroid drug for 5-20 months. Beneficial results were obtained in all four patients. They were able to tolerate more exercise. Congestive heart failure diminished, and precordial pain disappeared. Only one patient became myxedematous. A transient leucopenia was observed in two patients. This is a new aspect of the use of thiouracil. Confirmation of these results will be awaited with interest.

SUGGESTED READING

Clausen, F. W.: Rocky Mtn. Med. J., December, 1946; also news comment in Drug Trade News, p. 58, Jan. 13, 1947.

R. W. C.

Consultation Service

We offer this special consultation information service as a regular monthly feature of *Postgraduate Medicine*. Readers are invited to call on this Service for answers to difficult medical problems from members of our editorial board best qualified to help. Each question will be answered by mail and answers of general interest will be published each month.

AGRANULOCYTOSIS AFTER SULFADIAZINE THERAPY

QUESTION: A patient developed agranulocytosis as a result of sulfadiazine therapy for a kidney infection. Could another sulfonamide be substituted or would there be danger of a similar sensitivity reaction? *M. D.—New Jersey*

ANSWER: There would be great danger of a similar reaction and one would not be justified in using a second sulfonamide. Penicillin should be given at once in the hope that recovery will ensue. It should be administered for a period after recovery.

CORONARY OCCLUSION FOLLOWING STRESS

QUESTION: Can strain produce coronary occlusion in a man 55 years old without previous history of heart disease? What have the courts decided regarding the relation of coronary occlusion to strenuous effort? *M. D.—Pennsylvania*

ANSWER: Coronary occlusion with thrombosis, or infarction without the presence of thrombus have been reported following stress in elderly people in whom there was no previous history of coronary heart disease or angina. It is safe to say that the absence of a history of coronary disease does not mean the absence of coronary sclerosis. Moreover the majority of patients with coronary sclerosis have hypertension, causing further cardiac burden. There is no evidence that physical effort produced intimal coronary hemorrhage. Infarction is found in about one-third of coronary deaths. Every year an amazing number of coronary deaths occur in middle and late life during an excessive physical activity. Often it is in professional men, executives and bankers who are not accustomed to physical exertion. One famous cardiologist, when asked about "work-outs" for middle-aged men, remarked that the gymnasium floor has proved to be the death arena for many sedentary persons.

Courts vary in regard to compensation, although they tend to accept the relationship of stress for sudden cardiac death. This is particularly true in occupations requiring physical exertion such as death occurring during police or fire duties.

Rh FACTOR IN HUMAN SERUM

QUESTION: Is it possible to transmit the Rh factor in human serum? Has the Rh factor been found in animals? *M. D.—Michigan*

ANSWER: The identification of the Rh factor occurred as a result of a very empirical observation that the serum of rabbits immunized with erythrocytes from a rhesus monkey would agglutinate 85 per cent of the tested white population of New York, irrespective of the blood group. The Rh factor is the result of a combination of human erythrocytes with serum containing agglutinins specific for a certain factor in that cell. Human serum may or may not contain anti-Rh agglutinins, but they do not contain the Rh factor which is the antigen contained in cells and which alone can sensitize. Convalescent human serum cannot therefore sensitize or "transmit" the Rh factor. It can only transmit anti-Rh agglutinins. It would be impossible to induce isoimmunization in an Rh-negative re-

cipient by use of serum from an Rh-positive donor.

For years it has been known that blood of some animals may contain antigens which will cause production of antibodies if injected into another animal of the same species whose blood does not possess that particular antigen (isoantigen). Isoimmunization has been accomplished with rabbits and mice.

EPILEPSY AND MENTAL PROCESSES

QUESTION: It is commonly stated that epilepsy affects the mental processes. Someone has stated that present authorities believe epilepsy seldom affects the mind. Can you tell me whether this is true, especially in regard to childhood epilepsy? *M. D.—Indiana*

ANSWER: The very nature of convulsive seizures is an interruption of normal mental processes. One must then distinguish between post-epileptic transient mental abnormalities and continuous mental impairment, both of which occur.

One conspicuous form of psychic disturbance due to epilepsy is the so-called post-epileptic automatism which consists of automatic repetition of common actions, such as undressing, dressing, hunting for objects, micturation, etc. These automatic patterns are more likely to occur after minor seizures which may not be noticed by friends. The epileptic may become combative, aggressive, hypomanic, even suicidal or homicidal. A famous neurologist testified in court that a patient who threw his infant daughter out of the window onto a stone-flagged yard where she instantly died as a result of a skull fracture, was in an irresponsible post-epileptic confusional state. Numerous psychic effects of epilepsy can be cited to show the effect of the disease on the mind beyond the period of convulsions. Epileptic furor, somnambulism post-epileptic fuges and equivalents are examples. It is safe to say that for practical purposes a person suffering from convulsions which are favorably influenced by medication need not fear losing his mind. It is indeed unusual for the epileptic to become insane.

It is paradoxical that convulsive therapy is used in certain mental aberrations.

SULFONAMIDES IN MASTOIDITIS

QUESTION: The controversy about administration of sulfonamides in early or suspected cases of mastoiditis complicating otitis media seems to revolve around the fear of masking a mastoiditis which will flare up and spread. Is this sound? Do sulfonamides help clear up mastoiditis, in addition to preventing septicemia?

M. D.—Montana

ANSWER: The incidence of mastoiditis complicating otitis media has diminished since the advent of sulfonamides and is due to successful suppressive and curative therapy. Sulfonamides may be used in conjunction with penicillin in cases of otitis media and should be continued for at least a week after the ear is dry and evidence of acute infection has disappeared. If sulfonamides are administered they should be given in adequate amounts; the infection will not respond to inadequate concentration of the drug. Sulfonamides assist the body in curing mastoiditis under some circumstances. The question of "danger of masking" mastoiditis implies that some form of reliable therapy, presumably surgery or chemotherapy is to be instituted as soon as the diagnosis is made. One should not wait for advanced stages of a disease when chemotherapy may abort it, and if it does not, it is still the first therapeutic effort to be made. Reason for failure is often inadequate blood levels, and suspension of therapy too soon.

OVULATION DURING PREGNANCY

QUESTION: Does ovulation cease for the duration of pregnancy? *M. D.—Iowa*

ANSWER: Ovulation may occur at any time, before birth, before puberty, after the menopause, and with pregnancy—"fruit before flowers" (de la Motte)—and during intervals of amenorrhea. Ovulation is effected by the gonadotropic hormone. It is suggested by some authors that the hormone of the corpus luteum inhibits ovulation during pregnancy although clinical experience shows this is not invariable.

Men of Medicine

A GREAT MEDICAL HISTORIAN

Victor Robinson is dead! In late years I had lost contact with him, but ours was a friendship of long standing, and it mattered little whether I saw him or not. We had eaten our peck of salt, and the bond was fixed for all time. Yet it is in a singular sense that I term him friend.

I have his works before me, and on the flyleaf of each volume I find inscribed in his racy and erratic hand some affectionate greeting that hints, but never attains full cordiality. Victor was warm, and kindly; he was generous and hospitable, yet there was always a withholding.

Had I not known him for so many years, and had I not seen him among his own and with others, I could easily have been persuaded that it was I who hobbled his spirit. But I *had* seen him with others, and furthermore, I had known his father, William J.

They made a marked contrast, father and son. William J. was deep-chested, stocky, bellicose, and a prime extrovert. Victor was frail, gentle, courteous, retiring. I would not set myself to judge between father and son. God spare the mark! But for having known the father, I can better understand the son. William J. was a slashing pioneer; an uncouth version of Havelock Ellis. But then the American scene, too, was uncouth, what with William Jennings Bryan and his "monkey trial," Comstock and "September Morn," and Volstead with prohibition. The reeds of Pan could hardly be heard; the steam calliope alone could rise above the cacophonous din of the Age. William J. was noisome. But then was Rabelais gentle and soft-spoken, or Luther?

Victor was of a softer mood. He was lyrical, indeed with a good deal of the poet in him. He was a gentle rebel. One of his earliest works dealt with the pioneers of birth control. Another was a defensive biography of Clevinger, a bizarre but somewhat maligned character in American neurology and psychiatry. Even his capo-lavoro, the biography of Jacob Henle, was composed, one readily senses, not solely to reveal his hero but to gain for him credit not only long overdue, but long assigned to others.

Victor wrote in a somewhat flowery style, and he fancied himself a defender of the liberal cause. He was, so far as I could discern, without political partisanship. He merely and eloquently was against the ugly, the mean, the brutal, the stupid. Naturally he found much in every age at which to tilt his Quixotic lance.

As he grew older, his romantic liberalism acquired a somewhat cynical flavor. Or shall I say that, like the Elder Plato, having experienced both the mob and the tyrants, he came to trust ideas more than men?

In the foreword to his *Pathfinders in Medicine*, Victor wrote his late confession of disillusionment:

"During that spiritual journey in which we all partake—and the more perilous the voyage, the more imperative that we embark—the author entered many temples and knelt before many shrines: the idols of his early days have fallen from their pedestals, and the Truth lay reachless beyond the abandoned altars. The author's belief in a Beneficent Being disappeared painlessly, for it was succeeded by an ardent faith in Humanity—which in turn succumbed when he found that

human history is as cruel as Nature. The vulgarities of patriotism, the corruption of officials in high places, the degeneracy of the Daughters of the American Revolution, the Sacco-Vanzetti case, the censorship of books and plays, the legislation against science, and the hypocritical farce of prohibition, have destroyed his last vestige of hope for democracy. On the other hand, the radicals and freethinkers he has met, and whom he once regarded as the harbingers of a better era have proved equally impossible. Having cherished many creeds, the author now finds himself without any, and at last realizes the wisdom of Lessing's words: 'I hate all people who want to found sects. It is not error but sects—it is not error but sectarian error, nay and even sectarian truth, which causes the unhappiness of mankind'."

I met him in 1921—more than a quarter of a century ago—when he was still at 12 Mount Morris Park West. There Victor edited his *Medical Life* and there as best he could, he gathered periodically the few and motley devotés of medical history. I cannot now say whether our efforts were more heroic than mangy, or vice-versa. I know my own contributions were quite puerile. But to the abiding glory of Victor it must be said that he more than anyone else fostered interest in medical history in America. *Medical Life* was for years the only journal in America devoted to medical history. It bridged the continents and brought to us, the neophytes, acquaintance with the learned. It is thus, and not from our academic teachers, that we learned of Pagel, Neuburger, Castiglioni, Rolleston, Sigerist, Sudhoff.

He implanted within us an appreciation of history; that it is the handmaiden to understanding.

Victor was not exactly a prolific writer, but he composed a most creditable collection of works, mainly essays on historical personalities. His *Medical History* is still a very readable resumé. Like his essays, it is crisp and sparkling with many neat phrases and apt images. Victor was fond of words and used them skilfully.

VICTOR ROBINSON

For many years Victor Robinson toiled mostly alone, aided only at times by such erratic and delinquent "co-workers" as myself. In retrospect it is clear that he had but little recognition for his labors. True lately he was appointed Professor of Medical History at Temple University. But that was after thirty years of labor. All honor to Temple University.

I have spoken of Victor's father. There is need to say a word about his mother. No doubt it was she who gave him the poet's spirit, the gentle touch. It was she who sustained him when he was young, and in her pride of him, gave him courage to go on.

To her, surviving, those who were privileged to know Victor bring condolence, and recognizance for all that was good and fruitful in their friend.

G.

Book of the Month—A Report

THE SECOND FORTY YEARS*

An understanding of the problems of the aging and the aged is invaluable to the general practitioner, personally and professionally. If life begins at forty, every effort should be made, not only to extend it, but to make it as pleasurable as possible. Probably no more than a fourth of the patients who consult a doctor have purely organic ailments. Many have nothing organically wrong at all. Yet the problems of these patients are real and require attention. Particularly do the older patients need treatment, counsel and guidance if they are to live to the fullest extent their remaining years of life.

Even a non-gardener knows the difference in yield between a cultivated patch of land and a neglected one choked with weeds.

Precisely the same relationship exists for man between the results of planned, cultivated senescence in the "years of harvest," and mere passive aging.

As with a plant, man's life is conditioned by the seed—heredity, the soil and climate—his mode of living, and cultivation—care and repair after intercurrent disease.

This in essence is the message of "The Second Forty Years" by Edward J. Stieglitz, M.D., which constitutes a non-technical guidebook to longer, richer life.

Intended primarily for the layman, the volume makes easily identifiable the "weeds" which too often are permitted to clutter up man's garden of years.

With the population of the United States growing older in terms of average age, the problem of senescence assumes greater urgency. The Stieglitz study is an attempt to define the issues, and to outline a course of positive action.

Through the years wars, famine, pestilence, droughts and floods have altered the picture, but always in the direction of a relative increase in youth. Now, however, we have the result of constructive forces, wherein medical science and the diminished rigors of modern civilization have enabled many less vigorous youths to survive into full maturity.

A man's life expectancy in the United States in 1900 was 47 years; today an infant born in this country has an average longevity of 65. In another 40 years, assuming there will be no net immigration or emigration, the United States census bureau predicts that more than 40 per cent of America's population will exceed 40 years of age!

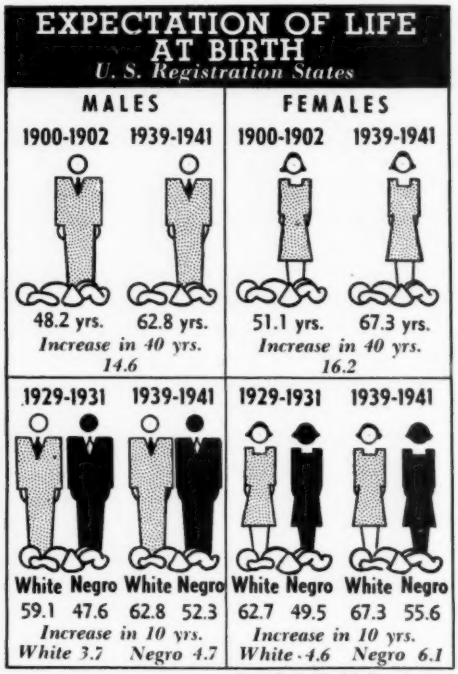
This anticipated change in the character of our population will have immense bearing on our entire pattern of national life—to science, society, industry and the state as well as to the individual.

In large part this is the legacy of the researchers, for it has been their work in preventive medicine, sanitation, nutrition, and vastly improved care of the health of children which so dramatically has raised the average age of the nation's people. Coupled with this, as pointed out by Stieglitz, is the reduced birth rate—for which, it might be added, the investigators need not necessarily shoulder the responsibility.

But considering that society fosters research to save and prolong life and supplies those procedures which increase the average longevity, then, Stieglitz contends, it also must accept the responsibility of the lives thus prolonged.

Today, the ratio of men and women in the popu-

*"The Second Forty Years," by Edward J. Stieglitz, M.D., J. B. Lippincott Company, $2.95.



DEATH RATES FROM "SENILITY" *per 100,000 Population 1900 to 1940 U. S. Registration States*

	1900 Rate	1940 Rate
55 to 64	10.9	1.4
	Decrease 9.5 *Percent decrease* 87%	
65 to 74	196.8	18.9
	Decrease 177.9 *Percent decrease* 90%	
75 & over	2767.3	330.6
	Decrease 2436.7 *Percent decrease* 88%	

From: Geriatrics

lation from 60 to 80 years is regarded as a vital economic, social and medical problem. Dr. Stieglitz, specializing in the field of geriatric medicine, maintains that sufficient scientific understanding of the factors and processes of aging exists to solve this enigma.

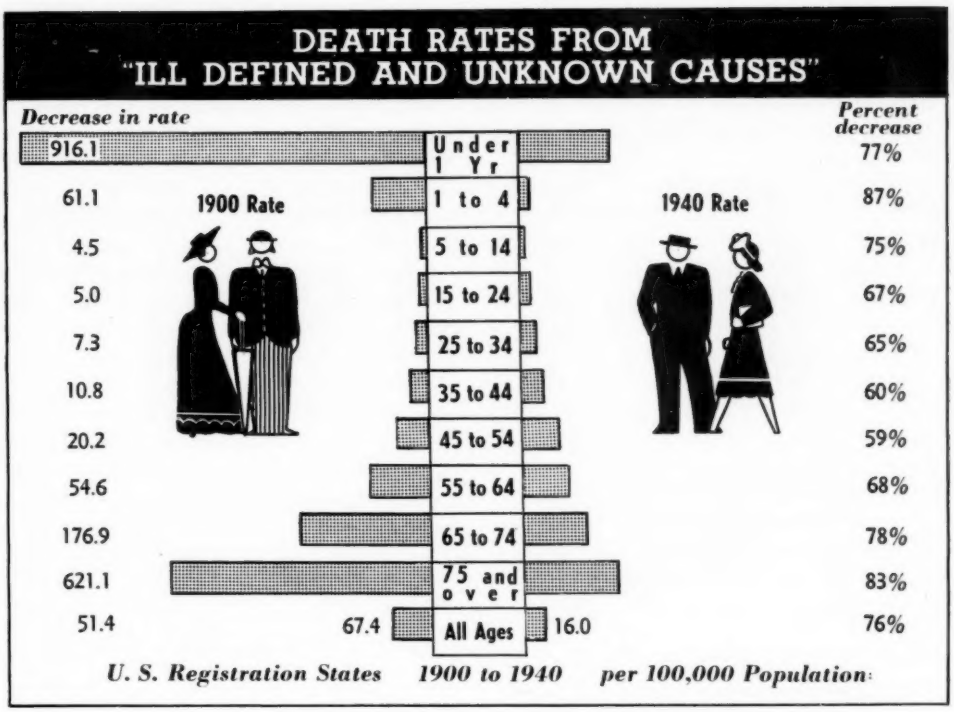
What is next required is that this understanding be translated into the daily regime of as many persons past 40 as possible. Inasmuch as the first 40 years have a very real, though sometimes incalculable effect on the second 40—indeed, determine whether there even shall be a second 40—Dr. Stieglitz's suggestions constitute a challenge to all past 20 who think of themselves in terms of a tomorrow.

Many of the decrements which come with aging can be prevented or at least retarded, the author points out, and senescence assuredly is not all decline, anyway. While some functions and capacities do insidiously but persistently taper off, certain other faculties actually may increase in later life. With planned cultivation of these compensatory capacities, full, rich, fruitful lives are attainable in the "home stretch" of our earthly span.

"Almost no one *wants* to grow older," Dr. Stieglitz points out, "but this is not the way of nature. It cannot be forever spring, fragrant with blossoms and enticing with promise. After the bloom comes the fruit and later yet the harvest. Thus the second 40 years of life might readily be called the 'Years of Harvest'."

The dislike generally expressed at the thought of growing older is in reality largely fear, Stieglitz maintains; fear, of course, is primarily a reaction to the unknown. Varying reasons for this dread have been noted: abhorrence at the idea of losing attractiveness of youth, resentment over loss of physical vigor, apprehension that the time to accomplish what the person wants to do in life is getting short.

Inasmuch as we cannot stop aging, says Stieglitz,



From: *Geriatrics*

we *can* grow older *intelligently,* but preparation and planning are required.

The latter half of life is divided by Stieglitz into three periods: later maturity or early senescence (approximately 40 to 60 years), late senescence (60 to 75 years), and senility (after 75, although true senility may be delayed until after 80 or even 90).

Aging does not start abruptly but is a continuous process which starts with conception and ends only with death.

In seeking to prolong the useful period of man's life, Stieglitz makes clear, science is not *creating* a formula; it is merely learning to accomplish seeming miracles within the framework of basic fundamental laws.

"There are millions of sane adults who daily attempt to violate the inflexible laws of nutrition and hygiene, and hope to evade the consequences," the author points out. "They do not evade them, though the penalties are often so delayed and obscured that they are not easily associated with the specific violations. Nevertheless, there is always a price which must be paid for every biologic insult, be it by commission or omission."

Does the application of modern knowledge concerning mental and physical health maintenance mean we must lead restricted, flavorless, antiseptic lives in constant dread of violating some rule?

It does not, Stieglitz asserts. But it does mean we must prepare for the inevitable changes which constitute senescence.

The series of changes which result in normal aging are primarily two-fold: growth and atrophy. These occur side by side in the same organism throughout life, though at varying degrees and rates. A high degree of constancy in the internal environment is essential to the continuance of health and of life itself. Any impairment of these sensitive equilibratory mechanisms reduces the adaptability of the organism to alterations in en-

vironmental conditions. Though man becomes less and less adaptable with aging, the margin of safety is wide enough so that in the absence of disease, the homeostatic mechanisms are adequate for more than a century of life if the stresses imposed upon them are not too great.

"Asymmetry of aging, revealed by accelerated senescence of certain structures at certain phases in the life span, is intimately related to functional activity," Stieglitz shows. "Use induces hypertrophy. Disuse results in atrophy. Abuse encourages degeneration. All these are significant factors in the fundamental mechanisms behind the changes of senescence.

"There is considerable variation in the rate of aging between different individuals so chronologic age can be sadly misleading."

The health hazards of senescence can be divided into two major groups: Those diseases which may occur at any age and to which the senescent is neither more nor less vulnerable than other individuals, and certain disorders peculiar to the period of senescence.

It is the latter group which produces the specific risks of the second 40 years. Included in this category are, broadly, circulatory disorders, metabolic diseases, involutional mental disturbances, disorders of joints, and tumors, both benign and malignant. The relationships between many of these disorders frequently are reciprocal.

From this explanatory background, Stieglitz's suggestions are, simply, common sense.

Inasmuch as the sense of pain, "the most precious protective device with which we are endowed," is dulled in the aging and especially in the aged, regular health examinations are recommended. Coupled with the desire to learn the truth about our body's defects, the will to get well is necessary, if health is to be recovered and maintained. "Once the will is lost," the author writes, "individuals go downhill with surprising speed."

Significant characteristics of the major health hazards of later years are the silent way in which these illnesses begin, and their progressiveness. Yet also significant is the fact that "if these chronic, progressive disorders are discovered early, there is plenty of time for treatment to accomplish much."

Responsibility for doing something constructive rests on the medical profession, on the senescent individuals themselves and on society as a whole, Stieglitz points out. The physician's responsibilities fall into three broad categories: research into causation, improved treatment, and education. The individual owes it to himself and his family to follow a simple list of do's and don'ts. Society can do much toward increasing the facilities for early medical care of chronic disorders and toward active health maintenance of mature adults.

Insistently, however, Stieglitz keeps returning to the individual and his problems—handicapped heart, high blood pressure, change in diet, the change in sex interests, cancer, and the mental outlook.

It will be seen that growing old is not an overnight occurrence. Neither is the proper preparation for it a matter of after-thought or second guessing. Stieglitz goes on the theory that "forewarned is forearmed." With all that medical science and practice has done and can do, it cannot supply the motivation for the effort required. It can, however, point the way and in fact can help keep the individual more nearly in the center of the road.

Stieglitz makes growing old actually sound like a graceful experience, if it is approached intelligently, with humility, and perhaps even humor.

RECEIVED THIS MONTH

PRINCIPLES AND PRACTICE OF OBSTETRICS: By Joseph B. DeLee, M.D., late Professor of Obstetrics and Gynecology, the University of Chicago; Consultant in Obstetrics, the Chicago Lying-in Hospital and Dispensary; and J. P. Greenhill, M.D., Attending Obstetrician and Gynecologist, the Michael Reese Hospital; Obstetrician and Gynecologist, Associate Staff, the Chicago Lying-in Hospital; Chairman Department of Gynecology, Cook County Hospital; Professor of Gynecology, Cook County Graduate School of Medicine. NinthEdition. 1011 pages; 1108 illustrations on 860 figures, 211 in color. Philadelphia and London: W. B. Saunders Company, 1947. Price $10.00.

What Other Editors Think

Editorial Evaluations of Current Contributions to Medical Progress

VITAMINS IN HUMAN MILK

CAREFULLY planned and co-ordinated investigations recently reported by Macy and others provide further information on the vitamin contents of human milk, and an accurate assessment has been made of the substantial demands for these nutrients made by the infants. The general plan of the experiments was to estimate the vitamins by chemical or microbiological methods in specimens of colostrum and of mature milk taken from large numbers of mothers at successive intervals after parturition.

It was fully realized by Davies and colleagues that the composition of milk varies according to whether it is collected in the early or late stages of any particular withdrawal, and precautions were taken to avoid undue errors from this source. Usually the milk from mothers on a carefully chosen institutional diet was compared with that of mothers who had chosen their own diet, but the differences found, even if in some cases statistically significant, were relatively small.

The different concentrations of vitamins in colostrum and mature milk was one of the points studied. Previous knowledge has been confirmed, and valuable new facts have been collected. Thus, as compared with mature milk, colostrum contains ten times more carotene, twice as much vitamin A, and half as much again of ascorbic acid and nicotinic acid. On the other hand milk is about five times richer in pantothenic acid than is colostrum; the concentration of biotin is doubled as the milk matures, and the content of thiamin and riboflavin increases greatly. A difference in behavior between fat-soluble and water-soluble vitamins might perhaps have been expected, but the observed divergencies between the various water-soluble vitamins present an interesting problem to the biochemist.

Equally interesting, and possibly of more practical importance, are the differences shown by Lawrence and his colleagues in the vitamin contents of mature human milk and mature cows' milk. The data for human milk were mostly taken from Macy's investigations, with the women choosing their own diets. Human milk is much richer than cows' milk in vitamin A, ascorbic acid, nicotinic acid, inositol, and folic acid, and much poorer in thiamin, riboflavin, and biotin. But lactation makes severe demands on the mother's vitamins. If 900 ml. per day is taken as a typical output during the middle stages of lactation, the mother loses on an average 585 μg., or about 2,000 I.U., of vitamin A, and 45 mg. of ascorbic acid daily. Experiments by the Medical Research Council have shown that 1,250 I.U. of vitamin A daily are enough to cure experimental deficiency in adult humans, while a daily intake of 45 mg. of ascorbic acid would be considered by many to be an adequate safeguard against scurvy.

British Medical Journal, No. 4484, p. 908

A TEMPORARY KIDNEY

FINE and his group have recently announced the successful treatment of otherwise doomed patients with uremia using peritoneal irrigation as an extrarenal pathway—a temporary substitute for the normal excretory function of the kidney. Their thesis is built upon the fact that the peritoneal membrane has long been recognized as an excellent dialyzing membrane readily permeable to water and crystalloids. Peritoneal irrigation makes use of this dialyzing capacity for the removal of diffusible substances from the plasma and ultimately from the extracellular fluid. Proper adjustment of the irrigating fluid prevents depletion

below the normal concentration of the plasma constituents, and thereby protects the chemical structure of the extracellular fluids. In their experimental work in dogs, it was found that adequately conducted peritoneal irrigation would provide 50 to 75 per cent of normal kidney function in terms of urea clearance. The early work was in acidosis and uremia following bilateral nephrectomy.

The irrigation fluid was modified Tyrode's solution of many electrolytes. A later revision used 2 per cent glucose rather than glucose in normal blood concentration. This was found to leave less fluid in the tissues, and served as well as a considerable source of nutriment to the patient. Two tubes were placed within the peritoneal cavity, usually under local anesthesia and through flank wounds. The intake tube was connected to a gravity feed system for introduction of the fluid. The outflow tube was comprised of a stainless steel sump-drain—the metal perforated suction tube commonly available in operating rooms. This was attached to a constant suction line. Using this arrangement the patency of the tube is maintained for an indefinite period of time. The sump-drain is usually directed into the cul-de-sac. Heparin is used to prevent the formation of fibrin and intestinal adhesions. Penicillin is used for prophylaxis against infection. Sodium sulfadiazine should not be added if renal sensitivity to sulfonamides is present or suspected.

Once this system is set up it is virtually self-maintaining. However, collateral therapy is necessary for maintaining nutrition and water soluble vitamin balance, and in correcting anemia, acidosis, hypoproteinemia. The treatment of associated disease remains as a formidable problem. Fine and his group found early in their clinical experience that large volume parenteral fluids were unwise because of the overload upon the cardiac and pulmonary systems. Instead, highly concentrated small fluid volume solutions seem to be much more satisfactory. The addition of more hypertonic solutions to the peritoneal irrigating fluid, or even of plasma, aided in the picking up from the tissues of extracellular fluid. An excessive hemoconcentration is possible if the irrigating fluids also are made hypertonic. The effect of this temporary renal mechanism is detectable within the first twenty-four hours and it can be maintained for an indefinite period of time.

Several case reports Fine offered demonstrated no harm whatsoever despite the inlying tubes of twelve to fourteen days' duration. The problem seemed to be less that of maintaining free flow of the peritoneal irrigating fluid than it was the management of fluid balance and metabolic problems concerned with the patient's maintenance of life. Skillful use of the Miller-Abbott tube, appropriate surgical procedures, as well as other supporting treatments must be mixed skillfully and administered. Laboratory information at best enhances surgical judgment of these cases, rather than dictates treatment.

Since this device requires a minimum of maintenance and rests on solid experimental and clinical observations, it commends itself to immediate use in as many centers as these problems exist. Certainly it presents an original promise.—*Western Journal of Surgery, Obstetrics and Gynecology, Vol. 55, p. 77.*

EPIDEMIC DIARRHEA OF THE NEWBORN

Investigation of several outbreaks of epidemic diarrhea of the newborn has revealed many inadequacies in the care of the newborn in those hospitals where outbreaks occurred. In several hospitals overcrowding in the nursery, insufficient personnel, improper making of formulas and faulty sterilizing technics emphasize the need for greater diligence on the part of those responsible for the care of newborn infants.

Laboratory examination of so-called "sterilizing solutions," nipples and other utensils used in the nursery frequently showed heavy bacterial contamination. The presence of Group D streptococci in the noses and throats of infants ill with epidemic diarrhea suggests that these babies had been exposed to organisms normally found in the human intestinal tract. Salmonella infection of the newborn, three outbreaks of which have been reported in Massachusetts, is further evidence that because of poor technics in the nursery infants are

exposed to intestinal pathogens. In a recent investigation of Salmonella infection on a pediatric ward, it was found that individual thermometers were not available for each patient. Cultures of these thermometers after they had been "sterilized" revealed bacterial contamination. Similarly the vaseline used as a lubricant on the thermometers was also contaminated. Such faulty procedures provide ready means of transmitting infection from infant to infant.

Although infant mortality rates have declined considerably, neonatal death rates have remained fairly stationary.

It is apparent that, because of the large number of births that take place in hospitals, the matter of adequate infant care must be the direct concern of each administrator. Proper supervision of nursery technics and formula-making methods should be routine practice in all hospitals. Periodic inspections by health departments, including conferences with nursery supervisors on infant care, would constitute a real contribution toward the solution of this problem. Such a program would be a more practical and useful preventive measure than the routine reporting of all cases of suspected epidemic diarrhea to the local health department.

The New England Journal of Medicine, Vol. 236 p. 115

BED USAGE IN TUBERCULOSIS

SHOULD communities develop preventoria for children who are heavily exposed to tuberculosis and certain to become infected, but do not yet have clinical disease?

Study of family contacts has provided the answer to the question: Hospitalize the infectious adult source and thereby remove the danger of infecting children in the home. It is easier and more economical to hospitalize one parent than three or more children.

There is a known shortage of over 50,000 beds for the tuberculous in the United States.

Who will be chosen first for the available beds? How can the limited number of beds be used to greatest advantage?

It is suggested that the positive sputum cases be separated into two groups: The positive sputum case that has little hope of recovery and the positive sputum case with remediable disease. Hospitalize first the remediable positive sputum group. The irremediable positive sputum case could be isolated in the general hospital until the terminal episode. In this way both isolation and treatment are accomplished.

Advanced positive sputum cases already in sanatoria but not benefiting from treatment should be discharged and replaced by positive sputum cases that have chances of recovery. Such a practice protects the community and provides the opportunity to restore the health of the despairing ill. The minimal case with laboratory and other evidence of active disease should be given equal opportunity with the advanced remediable case, so that progression of disease can be prevented. Minimal cases that have, after careful and repeated search, no laboratory evidence of tubercle bacilli, can be supervised as ambulatory patients in the clinics and the offices of physicians trained in chest diseases. The utmost care must be exercised in the supervision of these ambulatory cases.

It may appear to be contradictory to find minimal cases and not to hospitalize all of them immediately. Yet experience shows that only a limited number of these cases break down.

We must think of the community first and the individual next. Available beds should be used principally for the spreaders of tuberculosis whose lesions can be arrested, and for minimal cases with laboratory evidence of active disease. This does not preclude the hospitalization of a limited number of minimal cases when the question of activity is still in doubt. It is becoming more and more widely recognized that a tuberculous patient is not only an individual in a community but also a carrier of a disease in that community. We must choose carefully in terms of social welfare if limited resources are to be utilized and tuberculosis eventually eradicated.

Herman E. Hilleboe—Assistant Surgeon General, Associate Chief, Bureau of State Services—Public Health Reports, Vol. 62, p. 186.

Correspondence

WHITHER THE GENERAL PRACTITIONER?

A Letter to the Editor

It was Pliny the Elder who wrote most succinctly, "With man, most of his misfortunes are occasioned by man." The various specialties in the field of medicine have also been fashioned by man, misfortunes and all.

It is not the intent of the writer to belittle the great roles and the accompanying benefits which these specialties and specialists have contributed to medical advancement and to mankind in general. Most sensible doctors will readily agree that the various specialties play a very important part in the public welfare. According to the words of the great Bard, "To loathe the taste of sweetness, whereof a little more than a little is by much too much," most things or practices, as a matter of fact, in too great amounts become overdone, and, in the opinion of this writer, the specialties are included in this statement.

One does not have to be a zealot to come to the conclusion that the specialties are being overemphasized at this moment. One has but to discuss the topic with almost any citizen. This investigation would yield this typical conversation: "I am very sick; my wife isn't ill, and my children don't feel ill. But I need a doctor in a hurry." "So far, so good," we may answer. Now the question is, whom shall the patient call? There are obstetricians, but no one is pregnant, so he won't call the obstetrician. Well, perhaps he should call a gynecologist. But, wait a minute! Is the patient a male or female? Oh, he's a male! No gynecologist then. The children aren't ill, so we don't need a pediatrician. The patient says, "I have a headache but no broken bones. Therefore I may not need an orthopedist. Do I need an operation? I hope not. Well, I won't call a surgeon for the time being. Perhaps I need a neurologist. True enough, I have a headache but with no visible paralysis. I'm not feeling particularly crazy at this time, so I won't call a psychiatrist. I'm not old enough yet to call in one of those fellows who practices geriatrics. I haven't a sore throat, so I won't need an ear, eye, nose, and throat specialist. My rectum doesn't bother me, so I won't need a proctologist. However, I'm still sick and I need a doctor."

At this point, I'm sure that some intelligent and alert reader may ask: "Why, for goodness sake, haven't you thought of calling in an internist?"

Now I am very happy that the reader mentioned this matter. Please do not forget that our patient is very ill. He is not a doctor. He is just a middle-aged white-collar worker who earns fifty dollars a week. There are thousands of others like him, but that is beside the point. He has a terrific headache! He remembers that you mentioned calling in an internist. Internist, internist! Yes, he remembers. That's the doctor who specializes in internal medicine. Let him try to think. He asks: "Is my illness internal or external? Perhaps I'd better look in a mirror. There's one in my wife's handbag right here. Here it is! Now let's take a look. Heavens! (or some other suitable exclamation at this point) I have a rash! No wonder I'm hot. I have an external disease. I don't need an internist. I need a doctor. Hurry, give me the name of a good general practitioner; I'm sick!" (He forgot to mention the dermatologist.)

Yes, I'll agree that this may be a bit far-fetched. But speaking quite frankly, you and I know of many cases where medical care was wanted, but since the sufferers couldn't diagnose their illness, they called in a general practitioner. They didn't know just what type of specialist they needed.

I will not dispute that a good specialist is better acquainted with his own specialty than is the general practitioner, although I know of several cases where the reverse held true. Generally speaking, however, the specialist is supposed to know his own field better than other doctors do. I know of one case where the head of the department of

internal medicine, in a well-known medical school, missed the significance of a chronically draining abscess of a leg. The patient had his leg amputated as the result; the case of osteomyelitis was not recognized. Of course, we all make mistakes as no one is infallible.

It seems to be human nature to want the best medical service obtainable when one is ill, especially if one can afford it. It is obvious that the specialties have been emphasized so much that the public is very conscious of the desirability of obtaining a "big professor" to make the patient well. The general practitioner has substituted when no specialist was available. "Of course, he doesn't know much, since he is a general man. He is acquainted with almost all the diseases of men, women, and children. But what does a fellow like that know, anyway?"

That, in general, then, is the reaction of the public to medical specialization. The public cannot be blamed for such an attitude. They read about this continual emphasis on specialization in the magazines and newspapers. They see the specialists glamorized on the screen in the form of the dashing surgeon in white. If they missed the movie, they can get the same thrills from their radio through the soap operas which continually glamorize the surgeons or other specialists.

I would be the last to blame the public for this misplaced emphasis on specialized medicine. I think that the profession itself should be blamed, in part, for this state of affairs.

To be specific, I shall have to cite cases. The *Journal of the American Medical Association* is the official publication of the American Medical Association. I think that I am correct when I say that the majority of the doctors of this country are general practitioners. If one reads this *Journal* religiously and thoroughly, as I do, one will discover that it contains articles of, by, and mostly for the various specialists and the specialties. It is a decidedly scientific journal, but I am afraid it is "over the heads" of many general men.

Let me explain this a bit further. In my opinion, many authors attempt to convince their readers that they are authorities on the subject which they discuss. That, no doubt, is very true. They go on, at length, stating the various complicated tests that they have employed to prove their points. That, again, is well and good, and I do not wish to appear arbitrary on the subject. But through this ultra-scientific writing they leave the mass of their readers far behind. The average general practitioner, who never will gain access to the scientific set-ups which are needed to understand such writing, is forced to read only the summary of most articles in the hope that each writer will there explain exactly what he has learned and what he wishes to prove by his lengthy dissertation. There are many doctors who gain newer knowledge by consulting the medical department of *Time,* where the newer medical discoveries are described succinctly and in an understandable manner.

Returning to *The Journal of the American Medical Association,* we find that most of the articles are written by specialists. I doubt whether any record is available as to the number of scientific contributions submitted by general men. As an editor, I know that these general practitioners write a great deal. They do not usually possess well-known titles nor do they have national reputations. Hence, they may find it exceedingly difficult to publish their articles in a publication which caters to big-name authors.

Just who profits by this present state of affairs? I do not think that the doctor in general practice profits as much as he would if these articles were presented in a less labored fashion. In other words, the specialist-author should remember that he is writing for the general man when he publishes his article in the official *Journal of the American Medical Association*. The editors should also take cognizance of this state of affairs.

It has been a long, uphill fight to establish the Section on General Practice of the A.M.A. Let us hope that this Section will soon play its rightful and important role in the Association, since it really represents the majority of the men in organized medicine.

In the profession itself we all have noted the trend towards specialization. Disregarding the financial remunerations which come with specialization the matter of prestige seems to be the main attraction for the younger men who graduate from our medical schools. As a matter of fact,

some of these medical schools stress the advantages of specialization.

These youngsters find themselves pondering over what field they plan to specialize in during their medical school days. It is true that they are subjected to the usual prescribed medical curriculum which acquaints them with every conceivable field. They study these courses with the view that these are required but that they will not need them in later years, since their chosen specialty will rid them of such uninteresting knowledge later on. In my humble opinion, this is stupid thinking. It seems to me that a medical student should not place emphasis on one course over another, since all such information may be necessary at all times during later years, whether he intends to specialize or not.

Furthermore, I have noted that those medical schools that do not stress specialization during the four academic years graduate men who are well-founded in most branches of medicine. Some medical school deans even suggest that their students plan to devote a few years to general practice before they plan to enter a specialty.

However, such a plan is disconcerting to those graduates who wish to obtain residencies in the specialty of their choice after a general internship. It may be more difficult to return to hospital life after one has been associated with general practice. Hence, few young men desire to enter the general field. They prefer to continue with a residency in a specialty following their internship.

Readers are well acquainted with the deplorable state in which rural medicine finds itself today. The general trend to the specialties may be the main cause for this serious condition. Most medical students now want to become big professors. Night calls and home deliveries are all right for old Doc Jones in the home town where the medical student was born. But the student wants to remain in the big city where his wife and he can partake of the advantages of urban life.

His medical school faculty members very seldom informed him that he really owes his home community the knowledge he has gained in the medical field. Loyalty to his community has been lost in his desire to make a name for himself in the large city. No one has informed him that he might be able to obtain very similar advantages if he were to return and practice in his own home town. He could study and write even if he were to live in the country. He might even be able to afford a month or two each year for further study.

All this works well when the economic condition of our land allows one to specialize in one's chosen field. When economic conditions readjust themselves, which they seem to be in the habit of doing quite regularly, the specialist begins to feel the brunt of the higher fees which he has been charging his patients. No longer can the public afford the high fees of the specialists. Business drops off. In order to meet his financial commitments, the specialist may decide to treat each and every patient who enters his office for whatever he can. Don't tell me that this has not been done before!

Then, the specialist is no more a specialist than is the general man in the rural community. Furthermore, the patients of such a "specialist" are in danger, for they are submitting to the services of a doctor who has had little if any training in medicine other than his own specialty.

Those specialists who can weather the economic storm will remain in the city, but the more unfortunate specialists, who do not have the necessary referred work, will either do general practice in conjunction with their specialty or they will move back to their old homes in the country in order to support their families through general practice.

People will always become ill. They will always need the services of a good doctor. They won't be too interested in the "big professors" who charge large fees, for when big fees have become but a blessed memory, the public will still want and need good doctors.

Whither the general practitioner? In this writer's opinion, most doctors, including many who are now specialists, will be glad to become known as just good general practitioners when the economic shoe begins to pinch. And if I may be so bold as to mention it, the shoe is now beginning to hurt just a bit at this time.

Wallace A. Marshall, M.D.
Mobile, Alabama

POSTGRADUATE COURSES

Complete information may be obtained by writing directly to the Institutions offering the courses.

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947

ALLERGY

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Allergy	1 month, full time, 1st of every month	200
The American College of Allergists, Inc., 401 LaSalle Medical Building, Minneapolis 2 At: University of Kansas School of Medicine, Kansas City, Kan.	Mississippi Valley Sectional Instructional Course in Allergy	May 5-7, 1947	35
Maine Medical Association, 177c Main Street, Waterville, Me. At: Boston	Allergy	Arranged, 1-2 weeks	Arranged[2]
Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston At: Boston Dispensary and Pratt Diagnostic Hospital, Boston	Allergy	May 19-23, 1947, 5 days, full time	40
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Allergy	Spring, 1947, 1 week	30

ANESTHESIOLOGY

Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Inhalation Anesthesia	First of every month, 1 month, full time	200
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Clinical Anesthesiology	Arranged, 3 months, full time	250
Columbia University At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Anesthesia[5]	Arranged, 2 weeks, full time	100
Duke University School of Medicine, Durham, N. C.	Anesthesiology	Arranged, 3 months or longer, full time	150 per quarter
University of Texas Medical Branch, 912 Avenue B, Galveston, Tex.	Inhalation, Spinal Block, Intravenous Anesthesia	Arranged, 3-6 weeks	Not given

ARTHRITIS

New York University College of Medicine, 477 First Avenue, New York 16 At: Bellevue Hospital	Arthritis and Rheumatic Disorders	Spring, 1947, 6 weeks, part time	100

CARDIOVASCULAR DISEASE

University of Georgia School of Medicine, University Place, Augusta, Ga.	Cardiology	Arranged, 2 weeks	50 res. 75 non-res.
Maine Medical Association, 177c Main Street, Waterville, Me. At: Boston	Cardiology	Arranged, 1-2 weeks	None[1]

References will be found on advertising page 19.

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

CARDIOVASCULAR DISEASE—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston, Mass. At: Pratt Diagnostic Hospital	Cardiology	May 12-16, 1947, 5 days, full time	40
University of Michigan Medical School, 1313 East Ann Street, Ann Arbor, Mich.	Diseases of the Heart	Spring, 1947, 5 days, full time	30
Columbia University At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Cardiology	May 5-29, 1947, 4 weeks, full time	125
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Diagnosis and Treatment of Diseases of the Heart	Arranged, 3 weeks, part time	75

CHEST DISEASES

California Tuberculosis and Health Association, 45 Second Street, San Francisco At: Medical Schools in Los Angeles	Tuberculosis	Arranged, 3 days, 2 weeks	None
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Technic of Physical Examination and Diagnosis of Chest	To be announced, 8 weeks, part time, 1 day each week	80
State Sanatorium, Sanatorium, Miss.	Chest Diseases Chest Diseases	All year, continuously, 2 weeks Continuously, 6 months	None None
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Pulmonary Tuberculosis	June, 1947, 1 month	150
Wisconsin Anti-Tuberculosis Association, 324 East Wisconsin Avenue, Milwaukee At: Health Service Building, 1018 North Jefferson Street, Milwaukee	Essentials of Chest X-Ray Films and Their Interpretation	6 weeks, 2 hours a week	Not given

DERMATOLOGY AND SYPHILOLOGY

Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Lecture and Clinical Course in Dermatology	June 16, 1947, 2 weeks, full time	100
Columbia University	Symposium on Dermatology and Syphilology[5]	May 12-17, 1947, 5 days, full time	90
At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Seminar in Dermatological Histopathology[5]	May 19-23, 1947, 5 days, full time	60
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Dermatology and Syphilology	First of any month, 6 weeks, part time	100
New York University College of Medicine, 477 First Avenue, New York 16	Industrial Dermatology	Spring, 1947, 3 weeks, part time for 2 weeks, full time for 1 week	100

DIABETES

University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Philadelphia Hospital	Diabetes Mellitus	Arranged, 2 weeks, 75 hours	150

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

ELECTROCARDIOGRAPHY

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Personal Course in Heart Disease and Electrocardiography	To be announced, 10 weeks, part time, 1 day each week	125
	Electrocardiography and Heart Disease	To be announced, 1 month, full time	175
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Electrocardiography	Spring, 1947, 2 weeks, part time	100
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Electrocardiographic Interpretation	Arranged, 2 weeks, 2 hours daily	75
University of Oregon Medical School, West Marquam Hill Road, Portland 1, Ore.	Electrocardiography	June 2-6, 1947, 5 days, full time	50
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Philadelphia Hospital	Electrocardiology and Cardiac Roentgenology[7]	Not given, 5 days, 30 hours	60

ELECTROENCEPHALOGRAPHY

University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Electroencephalography	Arranged, 3 weeks, full time	50
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Graduate Hospital of Pennsylvania Institute	Electroencephalography	Arranged, 6 Thursdays, 36 hours	150

ENDOCRINOLOGY

Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston At: Pratt Diagnostic Hospital	Endocrinology	May 26-30, 1947, 1 week, full time	40
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Endocrinology and Metabolism	Spring, 1947	15
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Endocrinology	May, 1947, 3 weeks, full time	150
	Physiology of the Endocrine System	One month, arranged	75
Duke University School of Medicine, Durham, N. C.	Endocrinology	Arranged, 3 months or longer, full time	150 per quarter

ENDOSCOPY

University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Bronchoesophagology and Laryngeal Surgery	May, 1947, 2 weeks, full time	150
Columbia University, 630 West 168th Street, New York 32 At: Columbia Presbyterian Medical Center	Gastroscopy[5]	Arranged, 2 months, 3 times a week	250
Columbia University At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Cystoscopy and Endoscopy	May 2, 1947, 15 sessions, part time	75
	Cystoscopy and Endoscopy	May 19, 1947, 15 sessions, part time	75
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Gastroscopy	Arranged, 2 weeks, full time	200
	Peritoneoscopy	Arranged	100
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Graduate Hospital	Bronchoesophagology, Gastroscopy, and Laryngeal Surgery	Arranged, 2 weeks, 85 hours	250
	Cystoscopy, Chromoureteroscopy, and Pyelography	Arranged, 6 weeks, 36 hours	300

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

FRACTURES

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Intensive Course in Fractures Special Course in Fractures	June 23, 1947, 2 weeks, full time To be announced, 10 weeks, part time	125 125
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Fractures and Allied Trauma	Fall and spring, 1947, 3 weeks, full time	150

GASTROENTEROLOGY

University of Southern California, Division of Graduate Medicine, 3551 University Avenue, Los Angeles 7 At: Los Angeles County Hospital	Gastroenterology, Course No. 741	May 12, 1947, 12 evening lectures, 1 evening weekly	50[1]
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Personal Course in Gastroscopy and Gastroenterology	May 19, 1947, 2 weeks, full time	200
Maine Medical Association, 177c Main Street, Waterville, Me. At: Boston	Gastroenterology	Arranged, 1-2 weeks	Arranged[2]
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Gastroenterology	Spring, 1947, 1 week	30
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Gastroenterology Physiology and Chemistry of the Gastrointestinal Tract, Digestion	Arranged, 1 month Arranged, 1 month	100 150
New York University College of Medicine, 477 First Avenue, New York 16 At: Lenox Hill Hospital	Gastroenterology	Spring, 1947, 7 weeks, part time, 2 mornings, 2 weeks	50
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Graduate Hospital	Clinical Gastroenterology[7]	Arranged, 16 weeks, 500 hours	400

HEMATOLOGY

Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston	Hematology C	June 9-22, 1947, 2 weeks, full time	100
New York Medical College Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Hematology	Spring, 1947, 2 months, Tuesday afternoons	50
New York University College of Medicine, 477 First Avenue, New York 16 At: Lenox Hill Hospital	Hematology	Spring, 1947, 6 weeks, part time	50

INDUSTRIAL HEALTH

Columbia University At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Symposium on Industrial Medicine	June 9-13, 1947, 5 days, full time	45
Wisconsin State Board of Health, Industrial Hygiene Institute, State Office Building, 1 West Wilson Street, Madison 2, Wis. At: Three cities in Wisconsin (to be selected)	Industrial Health Clinic	Probably May, 1947	None

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

MALIGNANT DISEASES

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
University of Kansas School of Medicine, 39th Street and Rainbow Boulevard, Kansas City, Kan.	Radiology and Cancer	June 9-13, 1947, 5 days	20[8]

MEDICINE, GENERAL

University of Southern California, Division of Graduate Medicine, 3551 University Avenue, Los Angeles 7	Clinical Review of Internal Medicine (Course 730)	May 5, 1947, 12 weeks, full time	250[1]
At: Los Angeles County Hospital	Nine-Month Internal Medicine Course (731)	Following course 730, 9 months	750[10]
Emory University Medical School, 50 Armstrong Street, Atlanta, Ga.	General Internal Medicine	Arranged individually, 2 weeks to 3 months or longer, full time	125 per quarter 12 per week
At: Affiliated Hospitals			
University of Georgia School of Medicine, University Place, Augusta, Ga.	Postgraduate Course for Negro Physicians	June 17-21, 1947, 5 days	None
	General Refresher	Intermittently, 3 weeks-3 months	50 res. 75 non-res.
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	2 Weeks' Course in Internal Medicine	June 2, 1947, 2 weeks, full time	75
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Refresher Course in General Practice for Veteran Physicians	Arranged, 3 months, full time	75 res. 100 non-res.
St. Elizabeth Hospital, La Fayette, Ind.	Postgraduate Medical Four-Year Extension Course	First Tuesday of every month, 3 hours per month, 12 months per year	None
State University of Iowa School of Medicine, Iowa City	Physicians' Monthly Clinical Conference	May 26-31, 1947, 6 days	None
	Physicians' Monthly Clinical Conference	June 23-28, 1947, 6 days	None
Kentucky State Medical Association, 620 South Third Street, Louisville, Ky.	Refresher Course	Continuously, 6 weeks	None
Flint-Goodridge Hospital of Dillard University, New Orleans	Postgraduate Course for Physicians	June 23-28, 1947, 6 days, full time	Not given
American College of Physicians, 4200 Pine Street, Philadelphia 4	Blood Disorders	Spring, 1947, 1 week	20 mem. 40 non-mem.
At: Tufts Medical School, Boston			
Massachusetts Medical Society, 8 The Fenway, Boston	Postgraduate Instruction	Throughout year	None
At: Boston and various parts of state			
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Diseases of the Blood and Blood-Forming Organs	Spring, 1947, 1 week	30
	Practitioners' Course	Spring, 1947, 2 days	None
At: University of Michigan Hospital	Personal Courses	Throughout year, varying lengths	30 per month
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Battle Creek-Kalamazoo, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Bay City, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Flint, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Grand Rapids, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Houghton, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Ironwood, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Jackson-Lansing, Mich.	Practitioners' Course	Spring, 1947, 2 days	None

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

MEDICINE—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
At: Marquette, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Powers, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Saginaw, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Traverse City, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
At: Upper Peninsula, Mich.	Practitioners' Course	Spring, 1947, 2 days	None
University of Minnesota Medical School, Department of Postgraduate Education, Minneapolis At: Center for Continuation Study	Conferences in Medical Technology	May 2-3, 1947, 2 days	Not given
	Conferences in Medical Technology	May 23-24, 1947, 2 days	Not given
	Conferences in Medical Technology	June 6-7, 1947, 2 days	Not given
University of Minnesota Medical School, Department of Postgraduate Education, Minneapolis At: Center for Continuation Study	Medicine	To be announced, 3 days	15
	Medicine	To be announced, 6 days	25
	Medicine	To be announced, 12 days	50
Mississippi State Sanatorium, Miss.	Internal Medicine	Continuously, all year, 2 weeks	None
	Internal Medicine	Continuously, all year, 6 months	None
Cornell University Medical College, 1300 York Ave., New York	Six Months' Postgraduate Course in Internal Medicine	First of each month, 6 months	250
Columbia University, 630 West 168th Street, New York 32 At: Mount Sinai Hospital	Diseases of the Liver, Biliary Tract and Pancreas—Introductory Course	May 7-June 11, 1947, 5 weeks, part time	60
Columbia University—At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Symposium on Internal Medicine	June 16-27, 1947, 10 days, full time	75[13]
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Peripheral Vascular Diseases	Spring, 1947, 2 months, 2 half days a week	100
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Course for General Practitioners	May 15, 1947, 6 weeks	100
	Course for General Practitioners	May 15, 1947, 3 months	200
	Courses in Forensic Medicine	Through June, 1947, variable	Variable
New York University College of Medicine, 477 First Avenue, New York 16 At: Lenox Hill Hospital	General Review for General Practitioners	Spring, 1947, 8 weeks, full time	125
University of North Carolina School of Medicine, Extension Department Chapel Hill, N. C. At: Various towns in North Carolina	University Postgraduate Course in Clinical Medicine	Spring, 1947, 1 day a week for 8 weeks	Not given
American College of Physicians, 4200 Pine Street, Philadelphia 4 At: University of Cincinnati School of Medicine, Cincinnati	Internal Medicine with Emphasis Upon Nutrition and Metabolism	May 26-June 7, 1947, 2 weeks	40 mem. 80 non-mem.
Ohio State Medical Association, 1005 Hartman Theater Building, Columbus 15, O.	Ohio State Medical Association Annual Meeting (Lectures)	May 6-8, 1947, 3 days	None
Tennessee State Medical Association, Doctors Bldg., Nashville 3, Tenn.	Five Courses on Postgraduate Instruction	Continuously, 10 meetings, 2 hours each	Not given
Vanderbilt University School of Medicine, Division of Postgraduate Instruction, 21 Ave. So. at Edgehill, Nashville, Tenn.	Medicine	May-Oct., 1947, 1 to 3 months, full time	166.66, 3 months

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

MEDICINE—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
University of Texas Medical Branch, Galveston, Tex.	Tumor Conference	June 14, 1947, 1 day	5
University of Vermont College of Medicine, Pearl St., College Park, Burlington, Vt.	Course for General Practice	Arranged, throughout year, 12 weeks, 3-5 hours daily	750 per year[11]
	Course in Internal Medicine	Throughout year, min. 4 weeks, 3-5 hours daily	750 per year[11]
	General Practice; Internal Medicine, Surgery	Throughout year, beginning of any month, 1-9 months	750 per year[11]
Medical College of Virginia, 12th and Marshall Sts., Richmond, Va.	St. Philip Hospital Postgraduate Clinic for Negro Physicians	June, 1947, 2 weeks	None res. 5 non-res.
The Medical Society of Milwaukee County, 202 E. Wisconsin Ave., Milwaukee	Postgraduate Course in Internal Medicine	Third week in May, 1947, 4 weeks	Not given
University of Wisconsin Medical School, 418 No. Randall St., Madison 6, Wis.	Observation Course for Specialists (Medicine and Surgery)[5]	Continuous, 1947, 2-6 months	100 per month
Creighton University School of Medicine, 306 North 14th Street, Omaha	General Medicine	Arranged, 3 months	None
	Special Courses	Individually arranged, 3 months	None
University of Nebraska College of Medicine, 42nd Street and Dewey Avenue, Omaha	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Beatrice, Neb. At: Chadron, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Grand Island, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Hastings, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Kearney, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: McCook, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Norfolk, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: North Platte, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Scottsbluff, Neb.	Extramural Continuation Courses	Arranged, 1 day afternoon clinics, evening lectures	None
At: Omaha, Neb.	Intramural Continuation Courses	Arranged, 1 and 2 weeks	None
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Immunology	Arranged	50
	Internal Medicine	Monthly, 1 month	150
	Parasitology	Arranged	75

NEUROLOGY AND PSYCHIATRY

American Institute for Psycho-analysis, 266 W. End Ave., New York 23	Problems in the Patient—Analyst Relationship[5]	Every week from May 1	20
New York Medical College, Flower and Fifth Avenue Hospitals, 1 E. 105th St., New York	Neurology	Spring, 1947, 1 month, full time	200
New York University College of Medicine, 477 First Ave., New York 16	Neurology	Spring, 1947, 6 weeks, part time 3 afternoons a week	75
At: Lenox Hill Hospital	Psychiatry	Spring, 1947, 6 weeks, part time, 2 afternoons a week	60
Duke University School of Medicine, Durham, N. C.	Neuropsychiatry	Arranged, 3 months or longer, full time	150 per quarter

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

NEUROLOGY AND PSYCHIATRY—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4	Clinical Psychiatry	Arranged, 8 weeks, 240 hours	160
At: Philadelphia Hospital At: Medical Laboratories and Affiliated Institutions	Clinicobiologic Neurology and Psychiatry[5]	Arranged, 10 weeks, 250 hours	100
University of Texas Medical Branch, Galveston, Tex.	Electroencephalography	By arrangement	Not given
	Electro-shock Therapy	By arrangement	Not given
	Technical Procedures of the Neurological Examination	By arrangement	Not given

NEUROSURGERY

Duke University School of Medicine, Durham, N. C.	Neurosurgery	Arranged, 3 months or longer, full time	150 per quarter

NUTRITION

New York Medical College, Flower and Fifth Avenue Hospitals, 1 E. 105th St., New York	Nutrition	Arranged, 1 month	150
Duke University School of Medicine, Durham, N. C.	Nutrition	Arranged, 3 months or longer, full time	150 per quarter

OBSTETRICS AND GYNECOLOGY

Alabama State Health Department and Jefferson County Health Department, Birmingham, Ala. At: Slossfield Health Center	Institute for Negro Physicians	July 15-17, 1947, 3 days	15
Chicago Maternity Center, 1336 S. Newberry St., Chicago	Postgraduate Training in Obstetrics and Gynecology	July, 1947, 4 months, full time	None
	Personal Course in Gynecological Surgery	May, 1947 (Tentative), 4 weeks, part time	80
	Personal Course in Gynecological Surgery	July, 1947 (Tentative), 4 weeks, part time	80
Cook County Graduate School of Medicine, 427 So. Honore St., Chicago	Practical and Didactic Course in Office Gynecology	May, 1947 (Tentative), 4 weeks, part time	80
	Practical and Didactic Course in Office Gynecology	July, 1947 (Tentative), 4 weeks, part time	80
	Obstetrics Gynecology	June 2, 1947, 2 weeks, full time	150
	Operative and Office Gynecology	May 12, 1947, 2 weeks, full time	150
	Operative and Office Gynecology	June 16, 1947, 2 weeks, full time	150
University of Maryland School of Medicine, Lombard and Greene Sts., Baltimore	Review of Gynecology, Oncology and Female Urology	Arranged, 10 weeks	125
University of Minnesota Medical School, Department of Postgraduate Education, Minneapolis 14	Obstetrics and Gynecology	To be announced, 3 days	15
	Obstetrics and Gynecology	To be announced, 6 days	25
At: Center for Continuation Study	Obstetrics and Gynecology	To be announced, 12 days	50
Creighton University School of Medicine, 306 No. 14th St., Omaha	Obstetrics and Gynecology	Arranged, 3 months	None

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

OBSTETRICS AND GYNECOLOGY—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Columbia University, 630 W. 168th St., New York 32	Obstetrics PM-80	July 1, 1947, 3 months	350
	Obstetrics PM-81	1st of every month, 1 month	100
At: Margaret Hague Maternity Hospital, Jersey City, N. J.	Observation Course	1st of any month, 1 month, full time	100
At: Mount Sinai Hospital	Diagnosis and Office Treatment of Gynecology	May 19, 1947, 15 sessions, part time	40
Columbia University—At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Gynecological Endocrinology	May 1, 1947, 24 sessions, part time	100
	Seminar in Gynecology	May 1, 1947, 2 months, full time	225
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Clinical and Operative (Cadaver) Gynecology	Arranged, 6 weeks	175
New York University College of Medicine, 477 First Avenue, New York 16			
At: Beth Israel Hospital	Gynecology	Spring, 1947, 16 weeks, part time	250
Duke University School of Medicine, Durham, N. C.	Obstetrics and Gynecology	Arranged, 3 months or longer, full time	150 per quarter
Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston			
At: Providence Lying-In Hospital and Rhode Island Hospital, Providence, R. I.	Obstetrics and Pediatrics	June, 1947, 1 month, full time	100

OPHTHALMOLOGY

The Children's Memorial Hospital, 707 Fullerton Avenue, Chicago	Postgraduate Conference in Neuromuscular Anomalies of the Eyes[5]	May, 1947, 6 days, full time	50
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Clinical Ophthalmology	Every 2 weeks, 2 weeks, full time	50
University of Michigan Medical School, 1313 East Ann Street, Ann Arbor, Mich.	Ophthalmology	Spring, 1947, 1 week	25
Washington University School of Medicine, Euclid Avenue and Kingshighway, St. Louis 10	Refresher Course in Ophthalmology	June 9-28, 1947, 3 weeks, full time	150
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Refraction	Arranged, 6 weeks, part time	100
New York University College of Medicine, 477 First Avenue, New York 16	Anatomy and Physiology	Each month, if 4 or more students, 4 weeks, 3 hours each week	50
At: New York Eye and Ear Infirmary	The Etiology and Surgical Treatment of Detachment of the Retina[5]	Arranged, 4 weeks, of 4 hours each week	75
	External Eye Diseases, Ocular Therapy[5]	Arranged, 1 month, 3 evenings a week	50
	Glaucoma Clinic[5]	Arranged, 8 weeks, 2 hours each week	50
	Motor Anomalies[5]	Arranged, 1 month, part time	50
	Neuro-Ophthalmology[5]	Arranged, 1 month, part time	60
	Ocular Muscles[5]	June, 1947, 1 month, 3 days a week	50
	Operative Eye Surgery (and with Animal Eyes)[5]	Arranged, 1 month, 3 evenings a week	100
	Ophthalmoscopy[5]	Arranged, 1 month, 2 days a week	50
	Perimetry[5]	Arranged, 1 month, 3 days a week	50

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

OPHTHALMOLOGY—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
At: New York Eye and Ear Infirmary	Plastic Eye Surgery[5]	June, 1947, 4 weeks, 3 days a week	75
	Refraction[5]	June, 1947, 3 months, 3 evenings a week	100
	Slit Lamp Microscopy[5]	June, 1947, 1 month, 2 days a week	50
Duke University School of Medicine, Durham, N. C.	Ophthalmology	Arranged, 3 months or longer, full time	150 per quarter
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Wills Eye Hospital	Ophthalmic Histology and Pathology	Arranged, 8 weeks, 96 hours	200

ORTHOPEDIC SURGERY

Duke University School of Medicine, Durham, N. C.	Orthopedic Surgery	Arranged, 3 months or longer, full time	150 per quarter
University of Oregon Medical School, West Marquam Hill Road, Portland 1, Ore.	Orthopedic Surgery	May 19-23, 1947, 5 days, full time	50

OTOLARYNGOLOGY

Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Clinical Otolaryngology	Every 2 weeks, 2 weeks, full time	50
University of Illinois College of Medicine, 1853 West Polk Street, Chicago	Refresher Course in Otolaryngology for Specialists[5]	May, 1947, 1 week, full time	50
Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston At: Boston Dispensary	Otolaryngology	Monthly, 3 or 5 mornings a week	30 for 3 a.ms 50 for 5 a.ms
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Otolaryngology	Spring, 1947, 1 week	25
At: University of Michigan Hospital	Ophthalmology and Otolaryngology[5]	Spring, 1947, 6 days, full time	50
Columbia University—At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Symposium on Otolaryngology[5]	May 12-23, 1947, 2 weeks, full time	90
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Head and Neck Dissection	Arranged, 6 weeks	150
University of Oregon Medical School, West Marquam Hill Road, Portland 1, Ore.	Special Refresher Course	Arranged, individually, full or part time	75 per month
Duke University School of Medicine, Durham, N. C.	Otolaryngology	Arranged, 3 months or longer, full time	150 per quarter

OTOLOGY

New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Advanced Otology	Arranged	82.50

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to Ju'y 15, 1947 — Continued

OTOLOGY—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
New York University College of Medicine, 477 First Avenue, New York 16 At: New York Eye and Ear Infirmary	Anatomy and Physiology[5]	Each month if 4 or more students, 4 weeks, 3 hours each week	50
	Anatomy of the Ear[5]	Each month if 4 or more students, 1 month, part time	50
	Clinical Otology[5]	Arranged, 4 weeks, 4 hours each week	75
	Operative Ear Surgery[5]	Each month if 4 or more students, 1 month, part time	200
University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Anatomical Laboratory	Otologic Operations (Cadaver)	Arranged, 2 weeks, 20 hours	100

OTORHINOLARYNGOLOGY

University of Pennsylvania Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4 At: Anatomical Laboratory	Rhinolaryngologic (Cadaver)	Arranged, 10 days, 20 hours	150

PATHOLOGY

Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	2 Weeks' Surgical Pathology	Through July, 1947, every 2 weeks, 2 weeks, full time	150
	1 Month Course, Surgical Pathology	Through July, 1947, every month, 1 month, full time	150
Creighton University School of Medicine, 306 North 14th Street, Omaha	Clinical Pathological Conference	Arranged, 3 months	None
	Medical and Surgical Pathological Conferences	Arranged, 3 months	None
	Microscopical Pathology	Arranged, 2 weeks	None
	Senior Clinicapathologic Conference	Arranged, 3 months	None
	Senior Pathological Conference	Arranged, 3 months	None
	Surgical Pathology	Arranged, 1 or 2 weeks	None
Columbia University, 630 West 168th Street, New York 32	Pathology	1st of any month, 2-6 months	55 per month
At: Mount Sinai Hospital	Surgical Pathology	1st of any month, 2-6 months	55 per month
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Clinical Pathology	Arranged, 26 hours, part time	100
	Pathology	Arranged, 16 weeks, half time	200
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Practical Laboratory Instruction in Pathology and Bacteriology	Arranged	Arranged
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Radiation Pathology	Spring, 1947, 16 weeks, part time	75 vets, 90 non-vets
University of North Carolina School of Medicine, Chapel Hill, N. C.	Pathology	Arranged	25
Duke University School of Medicine, Durham, N. C.	Gross and Microscopic Conferences on Surgical Pathology	Arranged, 3 months or longer, full time	150 per quarter
	Pathology	Arranged, 3 months or longer, full time	150 per quarter
	Pathological Research	Arranged, 3 months or longer, full time	150 per quarter
	Staff Appointments in Pathology	Arranged, 3 months or longer, full time	150 per quarter
	Systematic Review of General and Surgical Pathology	Arranged, 3 months or longer, full time	150 per quarter
Meharry Medical College, 1005 18th Avenue, Nashville, Tenn.	General Pathology	January 15, 1947, or thereafter, 3 months or multiples thereof	125 per quarter
University of Texas Medical Branch, 912 Avenue B, Galveston, Tex.	Surgical Pathology	By arrangement	Not given

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

PEDIATRICS

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Emory University Medical School, 50 Armstrong Street, Atlanta, Ga. At: Grady Memorial Hospital and Emory University Hospital	Pediatrics	Arranged, 2 weeks, 3 months or longer	125 per quarter 12 per week
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Clinical Course in Pediatrics	1st and 3rd Mondays of each month, except April, 1947, 2 weeks, full time	60
	Clinical Course in Pediatrics	1st and 3rd Mondays of each month, except April, 1947, 1 month, full time	100
Tufts Medical School, Postgraduate Division, 30 Bennet Street, Boston 11 At: Boston Dispensary, Boston Floating Hospital	Pediatrics	As demand arises, 1 week, full time	50
University of Michigan Medical School, Ann Arbor, Mich.	Pediatrics, New Developments in Pediatric Practice	Spring, 1947, 3 days	15
University of Minnesota Medical School, Minneapolis 14	Pediatrics	To be announced, 3 days	15
	Pediatrics	To be announced, 6 days	25
At: Center for Continuation Study	Pediatrics	To be announced, 12 days	50
Columbia University, 630 West 168th Street, New York 32	Clinical Pediatrics	May 5, 1947, 4 weeks, full time	125
At: Mount Sinai Hospital	Practical Clinical Pediatrics	June 2, 1947, 4 weeks, full time	100
At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Symposium on Recent Advances in Pediatrics	June 9, 1947, 6 days, full time	50
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York	Pediatrics	Arranged, 4 weeks, part time	50
Duke University School of Medicine, Durham, N. C.	Pediatrics	Arranged, 3 months or longer, full time	150 per quarter
Southern Pediatric Seminar At: Saluda, N. C.	Postgraduate Course in Pediatrics	Last 2 weeks in July, 1947, 2 weeks, 6 hours a day	25
University of Cincinnati College of Medicine, Eden and Bethesda Avenues, Cincinnati	Refresher Course in Pediatrics	July 15, 1947, 2 months, full time	30 per month
Tufts Medical School, Postgraduate Division, 30 Bennet Street, Boston 11 At: Providence Lying in Hospital and Rhode Island Hospital, Providence, R. I.	Obstetrics and Pediatrics	June, 1947, 1 month, full time	100

PHARMACOLOGY

University of North Carolina School of Medicine, Chapel Hill, N. C.	Pharmacology	Arranged	25
Duke University School of Medicine, Durham, N. C.	Pharmacology	Arranged, 3 months or longer, full time	150 per quarter
	Recent Advances in Pharmacology	Arranged, 10-12 weekly seminars, part time	150 per quarter

PHYSICAL MEDICINE

Northwestern University Medical School, 303 East Chicago Avenue, Chicago	Physical Medicine	Arranged, 3 months	166.66
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York 19	Physical Medicine	Arranged, 4 weeks	100
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital and Institute for Crippled and Disabled	Physical Medicine	Spring, 1947, 3 months daily, part time	200

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

PHYSIOLOGY

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
University of North Carolina School of Medicine, Chapel Hill, N. C.	Physiology	Arranged	25
Duke University School of Medicine, Durham, N. C.	Physiology	Arranged, 3 months or longer, full time	150 per quarter
	Recent Advances in Physiology	Arranged, 10-12 weekly seminars, part time	150 per quarter

PRECEPTORSHIP

Creighton University School of Medicine, 306 North 14th Street, Omaha	Preceptorship	Arranged, 3 months	None

PROCTOLOGY

Maine Medical Association, 177c Main Street, Waterville, Me. At: Boston, Mass.	Proctology	Arranged, 1-2 weeks	None[2]
Tufts Medical School, Postgraduate Division, 30 Bennet Street, Boston 11 At: Pratt Diagnostic Hospital, Boston Dispensary	Proctology III	May 12-June 7, 1947, 1 month, part time	100
New York University College of Medicine, 477 First Avenue, New York At: Proctologic Clinic of New York University and Bellevue Hospital	Proctology	Spring, 1947, 8 weeks, 5 days a week, 10-12 a.m.	100

PUBLIC HEALTH

New York State Department of Health At: Albany Medical College, 47 New Scotland Avenue, Albany, N. Y.	Extension Course for Grade II Health Officers (Correspondence)	Continuous, enter any time	40
University of North Carolina, Chapel Hill, N. C. At: University of North Carolina School of Public Health	Public Health	June-August, 1947, 3 month	100 per quarter

RADIOLOGY

American College of Radiology, 20 North Wacker Drive, Chicago At: Medical Schools	Special Courses	Varied	Varied
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Lecture and Clinical Roentgenology Course No. 1	1st Monday of every month, 2 weeks, full time	125
	Clinical Roentgenology Course No. 2	3rd Monday of every month, 2 weeks, full time	70
University of Kansas School of Medicine, 39th Street and Rainbow Boulevard, Kansas City 3, Kan. At: University of Kansas Hospitals	Radiology and Cancer	June 9-13, 1947, 5 days	20[6]
Maine Medical Association, 177c Main Street, Waterville, Me. At: Boston, Mass.	Roentgenology	Arranged, 1-2 weeks	None[2]
Harvard University Medical School, 25 Shattuck Street, Boston, Mass. At: Peter Bent Hospital	General Radiology	Monthly, 1 month	100
At: Massachusetts General Hospital	General Radiology	Through June, 1947, 1 month	100

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

RADIOLOGY—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
University of Michigan Medical School, 1313 East Ann Street, Ann Arbor, Mich.	Diagnostic Roentgenology	Spring, 1947, 1 week	30
University of Minnesota Medical School, Minneapolis 14	Radiology	To be announced, 3 days	15
	Radiology	To be announced, 6 days	25
At: Center for Continuation Study	Radiology	To be announced, 12 days	50
Creighton University School of Medicine, 306 North 14th Street, Omaha, Neb.	Radiology	Arranged, 3 months	None
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Diagnostic Roentgenology	Arranged, part time	150
	Radium and Roentgen Therapy	Arranged, part time	150
Duke University School of Medicine, Durham, N. C.	Radiology	Arranged, 3 months or longer, full time	150 per quarter
University of Oregon Medical School, West Marquam Hill Road, Portland 1, Ore.	Radiology	May 5-9, 1947, 5 days, full time	50
Meharry Medical College, 1005 18th Avenue, Nashville, Tenn.	Radiology	January 15, 1947, or thereafter, 3 months or multiples thereof	125 per quarter

SURGERY

University of Southern California, Division of Graduate Medicine, 3551 University Avenue, Los Angeles 7	Recent Surgical Advances, Course No. 756	May 14, 1947, 12 evening lectures, 1 evening weekly	50[1]
At: Los Angeles County Hospital			
Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	Clinical Surgery	May 12, 1947, 2 weeks, full time	85
	Clinical Surgery	June 9, 1947, 2 weeks, full time	85
	Gall Bladder Surgery	June 2, 1947, 1 week, full time	100
	General Surgery	May 26, 1947, 4 weeks, full time	300
	General Surgery	July 7, 1947, 4 weeks, full time	300
	Surgery of the Colon and Rectum	May 5, 1947, 1 week, full time	100
	Surgery of the Colon and Rectum	June 2, 1947, 1 week, full time	100
	Surgical Diagnosis, Postoperative and Preoperative Care	To be announced, 10 weeks, 1 day each week	100
	Surgical Technique with Practice	To be announced, 10 weeks, part time	200
	Surgical Technique	May 12, 1947, 2 weeks, full time	200
	Surgical Technique	June 9, 1947, 2 weeks, full time	200
	Thoracic Surgery	To be announced, 1 week	100
	Thoracic Surgery	To be announced, 1 month	300
	Vaginal Approach to Pelvic Surgery	May 5, 1947, 1 week, full time	100
	Vaginal Approach to Pelvic Surgery	June 9, 1947, 1 week, full time	100
University of Kansas School of Medicine, 39th Street and Rainbow Boulevard, Kansas City 3, Kan.	Surgery	May 12-16, 1947, 5 days	20[6]
At: University of Kansas Hospitals			
Tufts Medical School Postgraduate Division, 30 Bennet Street, Boston	Surgery	May 5-31, 1947, 1 month, full time	100
At: Pratt Diagnostic Hospital	Surgical Anatomy	Not given, 8 weeks, 3 days a week	200[1]
University of Minnesota Medical School, Department of Postgraduate Education, Minneapolis 14	Surgery	To be announced, 3 days	15
	Surgery	To be announced, 6 days	25
At: Center for Continuation Study	Surgery	To be announced, 12 days	50
Columbia University, 630 West 168th Street, New York 32	Symposium on General Surgery	May 12-17, 1947, 5 days, full time	50
At: Affiliated Hospitals			

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POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

SURGERY—*Continued*

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Columbia University At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Diagnosis and Treatment of Trauma	May 19-24, 1947, 6 days, full time	50
	Dissection and Surgical Anatomy[5]	Arranged, 12 sessions, part time	150
	Surgical Anatomy as Applied to Colon and Rectal Surgery (Cadaver)[5]	Arranged, 6 sessions, part time	100
	Surgical Anatomy as Applied to General Surgery (Cadaver)[5]	Arranged, 12 sessions, part time	200
	Surgical Anatomy as Applied to Thoracic Surgery[5]	Arranged, 12 sessions, part time	200
New York Medical College, Flower and Fifth Avenue Hospitals, 1 East 105th Street, New York	Gastrointestinal Surgery	Arranged, 1 month	200
	Surgical Aspects of Peripheral Vascular Diseases	Arranged, 1 month	200
	Thoracic Surgery	Spring, 1947, 3 weeks	325
New York Polyclinic Medical School and Hospital, 341 West 50th Street, New York	Clinical and Operative (Cadaver) Surgery	Arranged, 6 weeks, full time	200
Duke University School of Medicine, Durham, N. C.	Surgery	Arranged, 3 months or longer, full time	150 per quarter
County Medical Association, 3400 North Eastern, Oklahoma City At: Altus, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Alva, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Ardmore, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Duncan, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Enid, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Guymon, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Lawton, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Watonga, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
At: Woodward, Okla.	Surgical Diagnosis	Through June, 1947, 10 weeks, 3 hours a week	9[19]
University of Vermont College of Medicine, Pearl Street, College Park, Burlington, Vt.	Course in Surgery	Throughout year, 4 weeks, 3-5 hours daily (minimum) per year	750 per year[14]

THERAPY

Cook County Graduate School of Medicine, 427 South Honore Street, Chicago	X-Ray Therapy	Every 2 weeks, 2 weeks, full time	110
	X-Ray Therapy	Every 2 weeks, 3 months, full time	300
University of Michigan Medical School, Department of Postgraduate Medicine, 1313 East Ann Street, Ann Arbor, Mich.	Recent Advances in Therapeutics	Spring, 1947, 3 days	15
New York University College of Medicine, 477 First Avenue, New York At: Bellevue Hospital	Radiation Therapy	July 1, 1947, 52 weeks, full time	600 non-vets.[5] 500 vets.

TROPICAL MEDICINE

Columbia University At: New York Postgraduate Medical School, 303 East 20th Street, New York 3	Clinical Tropical Medicine and Parasitology	June 2-6, 1947, 5 days, full time	45

POSTGRADUATE COURSES

Postgraduate Continuation Courses for Practicing Physicians — May 1, 1947 to July 15, 1947 — Continued

UROLOGY

Institution	*Title of Course*	*Schedule of Course*	*Registration Fee and/or Tuition*
Long Island College of Medicine, Joint Committee on Postgraduate Education, 1313 Bedford Street, Brooklyn 2 At: Long Island College Hospital	Urology	First of each month, 1 month or longer, part time	25 per month
New York Hospital, 525 East 68th Street, New York At: Brady Foundation for Urology and New York Hospital	Postgraduate Course in Urology	July 1, 1947-January 1, 1948, 6 months, 33 hours per week	500 in advance
Duke University School of Medicine, Durham, N. C.	Urology	Arranged, 3 months or longer, full time	150 per quarter

VENEREAL DISEASES

Bureau of Social Hygiene, City of New York, Department of Health, 125 Worth Street, New York	Practical Course in Diagnosis, Treatment and Control of Venereal Diseases	Every 2 weeks, 2 weeks	None

1. Plus $5.00 registration fee.
2. Stipend provided when needed.
3. To be announced.
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Notes on Contributors

CONRAD J. BAUMGARTNER, M. D., is a graduate of the University of Nebraska (B. S., 1921; M. D., 1923) and received the M.S. in Surgery from the University of Minnesota in 1928. He is associate clinical professor of surgery at the College of Medical Evangelists in Los Angeles and is senior surgeon at Los Angeles County General Hospital, in addition to being active on the staffs of several other hospitals. Dr. Baumgartner has made a number of Surgical Anatomy films approved by the American College of Surgeons and is the author of numerous publications. He is a member of the American Medical Association, Western Surgical Association, American College of Surgeons and the Los Angeles Surgical Society of which he was president in 1946.

CLAUDE F. DIXON, M. D., received his degree from the University of Kansas in 1921 and the M. S. in Surgery from the University of Minnesota in 1926. He is now a member of the Surgical Section of the Mayo Clinic and Professor of Surgery at the University of Minnesota Graduate School of Medicine at Rochester, Minn. Dr. Dixon is a member of the American Association for the Study of Goiter, American Medical Association, American Surgical Association and a Fellow of the American College of Surgeons.

ISAAC S. TASSMAN, M. D. is the author of the 1946 Joseph Schneider Foundation Eye Presentation. The late Dr. Joseph Schneider, about two years before his death, established a trust fund with the Interstate Postgraduate Medical Association and specified that the interest was to be utilized by the Trustees for lectures on the eye and especially on the diseases of the eye in relation to general systemic diseases.

Dr. Tassman, who received his M. D. degree from the University of Pennsylvania, is associate professor of ophthalmology in the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania. He is the author of "Eye Manifestations of Internal Diseases," as well as numerous articles written for ophthalmological journals. He is a Fellow of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology, a member of the College of Physicians of Philadelphia and of the Ophthalmic Club.

JAMES E. PAULLIN, M. D., is a graduate of Johns Hopkins. He is Professor of Clinical Medicine at Emory University School of Medicine, Atlanta, Ga.; the President of the Interstate Postgraduate Medical Association and Honorary consultant in internal medicine to the Surgeon General, U. S. Navy. Dr. Paullin is a member of the American Clinical and Climatological Association of which he was president in 1936; American Medical Association which he served as president in 1943-44; Association of American Physicians, Southern Medical Association, Fellow of the American College of Physicians and was on the Board of Regents and president of this group from 1942-44.

RICHARD B. CATTELL, M. D., who is a member of the Surgical Staff of the Lahey Clinic, received his M. D. degree from Harvard Medical School in 1925. He is also on the surgical staff of New England Baptist Hospital and New England Deaconess Hospital. His professional affiliations include the American Association for the Study of Goiter, American Medical Association, American Surgical Association, New England Surgical Society and he is a Fellow of the American College of Surgeons.

LOUIS J. KARNOSH, M. D., received the B. S. and Sc. D. from Berea College and the M. D. from Western Reserve University. He is the author of "Handbook of Psychiatry," "Psychiatry for Nurses," and "A Psychiatrist's Anthology." Dr. Karnosh is a member of the American Psychiatric Association, American Neurological Association and Central Neuropsychiatric Association.

HARRY LIPSON, M. D., is a graduate of Ohio State Medical College and holds membership in the American Psychiatric Association, American Society for Research and In Psychosomatic Problems, Inc.

E. W. CRAWFIS, M. D., graduated from Ohio State University in 1935. He was assistant superintendent of the Lima State Hospital from 1938 to 1944 and was appointed superintendent of the Cleveland State Hospital in August, 1944. Dr. Crawfis is also clinical instructor in psychiatry at Western Reserve University School of Medicine; Examiner at the Veteran Induction Center and Demonstrator in Nervous and Mental Diseases for Western Reserve Academy of Medicine. He is a member of the American Medical Association and American Psychiatric Association.